C 21. 5 : 1059/2 Engr

Vol. 1059 Number 1

260

UNIVERSITY OF MICHIGAN
LIBRARIES

OCT 25 1985

DEPOSITED BY
UNITED STATES OF AMERICA

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

October 1, 1985

The University
of Michigan
Engineering
Library

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 1, 1985 Volume 1059 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1059 OG 2
Notice of Maintenance Fees Payable	1059 OG 2
Board of Appeals Decisions Rendered	1059 OG 2
Reissue Applications Filed	1059 OG 3
Requests for Reexaminations Filed	1059 OG 3
Service by Publication	1059 OG 3
Petitions Under 37 CFR 1.183 to Waive the One Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)	1059 OG 4
Patent Certificates of Correction	1059 OG 5
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1059 OG 6
Condition of Patent Applications	1059 OG 7
Reexaminations	1
Reissue Patents Granted (31,993)	3
Plant Patents Granted (5,564)	5
Patents Granted	
General and Mechanical (4,543,667)	7
Chemical (4,544,372)	257
Electrical (4,544,797)	373
Design Patents Granted (280,775)	473
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 52
Classification of	
Patents (Including Reissues and Reexaminations)	PI 55
Designs and Plants	PI 58
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 59
Designs and Plants	PI 60
Change of Address Form and Subscription Order Form	Back Page

THE UNIVERSITY OF MICHIGAN
NOV 19 1985
ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	
if paid before Oct. 5, 1985	$ 125.00
if paid on or after Oct. 7, 1985	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	
if paid before Oct. 5, 1985	500.00
if paid on or after Oct. 7, 1985	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Oct. 12, 1985	680.00
if paid on or after Oct. 15, 1985	750.00
International fees	
Basic fee (first 30 pages):	
if paid before Oct. 29, 1985	230.00
if paid on or after Oct. 29, 1985	280.00
Basic Supplemental fee (for each page over 30):	
if paid before Oct. 29, 1985	4.00
if paid on or after Oct. 29, 1985	6.00
Designation fee (for the first 10 national or regional offices):	
if paid before Oct. 29, 1985	55.00
if paid on or after Oct. 29, 1985	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Aug. 28, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 28, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,351,065 through 4,352,210

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	$ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of August 1985

Affirmed	205
Affirmed in Part	24
Reversed	70
Total	299

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,228,424, Re. S.N. 765,293, Filed Aug. 13, 1985, Cl. 340/506, CENTRAL STATION ALARM, Tom W. Lenay, et al., Owner of Record: *Inventor,* Attorney or Agent: Jonathan A. Marshall, Ex. Gp.: 268

4,247,637, Re. S.N. 761,930, Filed Aug. 2, 1985, Cl. 435/096, HIGHLY THERMOSTABLE GLUCOAMYLASE AND PROCESS FOR ITS PRODUCTION, Masaki Tamura, et al., Owner of Record: *Enzyme Bio-Systems, Ltd., Englewood Cliffs, N.J.,* Attorney or Agent: Ellen P. Trevors, et al., Ex. Gp.: 127

4,351,034, Re. S.N. 764,739, Filed Aug. 12, 1985, Cl. 365/189, FOLDED BIT LINE-SHARED SENSE AMPLIFIERS, Sargent S. Eaton, Jr., et al., Owner of Record: *Inmos Corp., Colorado Springs, Colo.,* Attorney or Agent: Edward D. Manzo, et al., Ex. Gp.: 233

4,480,696, Re. S.N. 763,121, Filed Aug. 6, 1985, Cl. 166/308, FRACTURING METHOD FOR STIMULATION OF WELLS UTILIZING CARBON DIOXIDE BASED FLUIDS, Stephen W. Almond, et al., Owner of Record: *Halliburton Co., Duncan, Okla.,* Attorney or Agent: Thomas R. Weaver, et al., Ex. Gp.: 356

4,506,940, Re. S.N. 766,470, Filed Aug. 19, 1985, Cl. 339/017, INPUT/OUTPUT INTERCARD CONNECTOR, John C. Asick, et al., Owner of Record: *AMP, Inc., Harrisburg, Pa.,* Attorney or Agent: Jay L. Seitchik, et al., Ex. Gp.: 322

4,515,388, Re. S.N. 765,689, Filed Aug. 15, 1985, Cl. 280/605, SKI BRAKE, Anton Emert, et al., Owner of Record: *Marker International Co., Salt Lake City, Utah,* Attorney or Agent: D. Peter Hochberg, Ex. Gp.: 316

4,516,481, Re. S.N. 766,247, Filed Aug. 16, 1985, Cl. 92/212, PISTON AND PISTON RINGS SET, Robert Geffroy, et al., Owner of Record: *Inventor,* Attorney or Agent: Lloyd M. Forster, Ex. Gp.: 341

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,319,515, Reexam. No. 90/000,842, Requested: Aug. 26, 1985, Cl. 356/357, INTERFEROMETRIC OPTICAL PHASE DISCRIMINATION APPARATUS, Philip A. Flournoy, Owner of Record: *E. I. DuPont de Nemours & Co., Wilmington, Del.,* Attorney or Agent: Howard P. West, Jr., Ex. Gp.: 255, Requester: Nicolet Instrument Corp., Minneapolis, Minn.

3,423,017, Reexam. No. 90/000,844, Requested: Aug. 28, 1985, Cl. 418/117, SCREW ROTOR MACHINE AND ROTORS THEREFOR, L. B. Schibbye, Owner of Record: *Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden,* Attorney or Agent: Herbert H. Goodman, Ex. Gp.: 343, Requester: Dunham-Bush, Inc., Washington, D.C.

3,579,939, Reexam. No. 90/000,841, Requested: Aug. 22, 1985, Cl. 52/397, FRAME STRUCTURE FOR GLASS OR SOLID PANEL WALLS, Ellis V. Eichman, Owner of Record: *Ellis V. Eichman, Brownsville, Tex.,* Attorney or Agent: None, Ex. Gp.: 350, Requester: Kawneer Co., Inc., Norcross, Ga.

4,103,350, Reexam. No. 90/000,845, Requested: Aug. 29, 1985, Cl. 366/2, METHOD OF REDUCING EMISSION OF PARTICULATE MATTER, James D. Brock, et al., Owner of Record: *Astec Industries, Inc., Chattanooga, Tenn.,* Attorney or Agent: Jones & Askew, Ex. Gp.: 242, Requester: Owner

4,211,490, Reexam. No. 90/000,847, Requested: Aug. 29, 1985, Cl. 366/1, DRUM MIX ASPHALT PLANT WITH FIBER FILTER DUST COLLECTOR, James D. Brock, et al., Owner of Record: *Astec Industries, Inc., Chattanooga, Tenn.,* Attorney or Agent: Jones & Askew, Ex. Gp.: 240, Requester: Owner

4,248,359, Reexam. No. 90/000,849, Requested: Aug. 29, 1985, Cl. 222/58, WEIGH-OUT SYSTEM FOR COLLAPSIBLE SURGE BIN, James D. Brock, Owner of Record: *Astec Industries, Inc., Chattanooga, Tenn.,* Attorney or Agent: Jones & Askew, Ex. Gp.: 240, Requester: Owner

4,348,146, Reexam. No. 90/000,848, Requested: Aug. 29, 1985, Cl. 414/332, SELF-ERECTING SURGE BIN, James D. Brock, Owner of Record: *Astec Industries, Inc., Chattanooga, Tenn.,* Attorney or Agent: Jones & Askew, Ex. Gp.: 317, Requester: Owner

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceeding sent by registered mail to the registrants at the last known address having been returned by the Post Office as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

A. M. Mfg. Corp., assignee, by mesne assignment, of Louis P. Mack, Chicago, Ill., Reg. No. 585,911, for the mark "ACTIVE MAN CHICAGO AND DES.", Canc. No. 14,861.

Magnatran Electric Corp., assignee, of Magnatran Inc., Kearny, N.J., Reg. No. 588,090, for the mark "MAGNATRAN AND DESIGN", Canc. No. 14,880.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A notice of opposition identified below having been filed, and the notice of such proceedings sent to applicant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the applicant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the opposition will be proceeded with as in the case of default.

National Foodline Corp., Minneapolis, Minn., Ser. No. 036,213, for the mark "EXXELLO", Opp. No. 58,041.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Petitions Under 37 CFR 1.183 to Waive the One Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)

Petitions to revive an unintentionally abandoned application (37 CFR 1.137(b)) or to accept an unintentionally late paid issue fee (37 CFR 1.155(c) or 1.316(c)) must befiled within one year of the date on which the application became abandoned.

In the last sentence of the above-noted subsections of 37 CFR, the Commissioner of Patents and Trademarks has indicated that petitions under 37 CFR 1.183 to waive any time period requirements for filing a request pursuant to these subsections will not be considered, but will be returned to the applicant. However, it has become apparent that under certain very limited conditions, the interests of the patent system would be better served by considering such petitions.

These very limited conditions arise when an application becomes abandoned due to an action or inaction by applicant and the Patent and Trademark Office performs a positive, documented and Official act* (e.g., by issuing an Official document) which could lead a reasonable individual to conclude that the action or inaction was appropriate. If this conclusion is a contributing factor in the applicant's failure to realize the true, abandoned status of his application in time to file a petition under one of the above-noted subsections, then conditions exist under which a §1.183 petition will be considered.

For example, if an applicant files papers for a continuing application under 37 CFR 1.60 or 1.62 on a date when the parent application is abandoned (e.g., the applicant neglected to obtain an extension of time in the parent application), the requirements of these regulations are not satisfied and the papers should not be processed into an application. However, if in spite of this error the Office issues a filing receipt for the continuing application, a reasonable individual could conclude that the continuing application had been properly filed on a date when the parent application was pending. Further, if the lack of copendency between the parent and the continuing applications is not discovered until after one year from the date on which the parent application became abandoned, the opportunity to obtain copendency by reviving the parent application under 37 CFR 1.137(b) is lost. As an additional example, if an applicant submits a check for payment of the issue fee and the payment is improper (e.g., the check is not timely submitted or is returned to the Office unpaid due to insufficient funds), the application should be held abandoned. However, if in spite of the improper issue fee payment the Office issues the application as a patent, a reasonable individual could conclude that the issue fee payment had been proper. Further, if the improper issue fee payment is not discovered until after one year from the date on which the application became abandoned, the opportunity to request acceptance of a late paid issue fee under 37 CFR 1.155(c) or 1.316(c) is lost.

The abandonment problems described in the above-noted examples are clearly attributed to an error on the part of the applicant. Nevertheless, such a problem could be aggravated when the Office performs a positive, documented and Official act* which, in the circumstances recounted above, may be a contributing factor in the loss of an opportunity to rectify this problem by filing a petition under one of the above-noted subsections. In light of these factors, the Commissioner will exercise his authority under 37 CFR 1.183 to waive the one year period requirement for filing a petition pursuant to 37 CFR 1.137(b), 1.155(c) or 1.316(c) providing the following strictly limited conditions are present:

(1) The applicant's action or inaction which caused the application to become abandoned was clearly an unintentional oversight which resulted from a bona fide attempt, as evidenced by Patent and Trademark Office records, to comply with patent statutes, rules and procedures in order to keep the application pending as desired; and

(2) The Office performed a positive, documented and Official act* which could lead a reasonable individual to conclude that the action or inaction was proper and this conclusion was a contributing factor in the applicant's failure to realize the true abandoned status of his application in time to file a petition under one of the above-noted subsections; and

(3) A petition under 37 CFR 1.183 and one of the above-noted subsections is filed within three (3) months of the date applicant is notified by the Office or otherwise becomes aware of the abandoned status of the application; and

(4) The petition is accompanied by a terminal disclaimer with fee under 37 CFR 1.321 dedicating to the public a terminal part, equivalent to the period of abandonment, of the term of any patent granted on the application or on any application entitled to the benefit of the filing date of the application under 35 USC 120.

For a transitional period of three (3) months from the date of this Notice, the requirement for filing a petition within three (3) months of the date referred to in condition (3), above, will not be enforced providing:

(a) the abandoned application could have been restored to pending status if a petition under one of the above-noted subsections had been timely filed; and

(b) the applicant made a bona fide attempt, as evidenced by Patent and Trademark Office records, to restore the abandoned application to pending status within three months of the date applicant was notified by the Office or otherwise became aware of the abandoned status of the application.

Applicants should note that this is intended to be a very limited extension of the Commissioner's discretion in exercising his authority to waive the one year period required under the above-mentioned subsections. For this reason, the above-noted conditions and provisions will be strictly adhered to and any petition under §1.183 which fails to comply with these conditions or provisions will be denied.

*NOTE: THE FAILURE OF THE PATENT AND TRADEMARK OFFICE TO SEND AN OFFICIAL COMMUNICATION (E.G., A NOTICE OF ABANDONMENT) IS *NOT* CONSIDERED TO BE A POSITIVE, DOCUMENTED AND OFFICIAL ACT WITHIN THE MEANING OF THIS NOTICE.

JAMES E. DENNY,
Aug. 26, 1985. *Deputy Assistant,*
Commissioner for Patents.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 1, 1985

D. 276,715	4,486,763	4,507,012	4,521,391
4,188,018	4,487,891	4,507,279	4,521,509
4,206,476	4,488,866	4,507,351	4,521,721
4,220,714	4,488,873	4,507,375	4,521,773
4,274,985	4,489,031	4,508,361	4,522,204
4,313,151	4,490,542	4,508,434	4,522,243
4,355,583	4,491,158	4,508,605	4,522,593
4,394,151	4,491,564	4,508,870	4,522,755
4,425,226	4,492,051	4,508,939	4,523,936
4,437,156	4,492,187	4,510,065	4,524,222
4,437,939	4,492,208	4,510,127	4,524,383
4,438,125	4,492,576	4,510,413	4,524,487
4,438,717	4,494,072	4,510,548	4,524,817
4,439,984	4,494,859	4,512,101	4,525,209
4,440,860	4,494,992	4,512,490	4,525,373
4,442,774	4,495,019	4,512,501	4,525,599
4,447,549	4,496,167	4,512,966	4,525,627
4,452,808	4,496,220	4,512,986	4,525,851
4,453,361	4,496,405	4,513,128	4,525,987
4,454,583	4,496,539	4,513,554	4,526,693
4,457,716	4,496,986	4,513,998	4,526,814
4,458,326	4,498,112	4,514,565	4,526,924
4,459,417	4,498,164	4,514,836	4,527,025
4,460,568	4,499,533	4,514,847	4,527,386
4,465,841	4,500,036	4,514,855	4,527,391
4,466,202	4,500,099	4,515,794	4,528,017
4,467,633	4,500,247	4,515,978	4,528,346
4,469,697	4,500,341	4,516,087	4,528,370
4,473,575	4,500,470	4,516,332	4,528,373
4,474,673	4,500,490	4,516,619	4,528,665
4,474,778	4,500,645	4,516,633	4,528,751
4,475,945	4,500,672	4,517,363	4,528,843
4,476,457	4,500,895	4,517,364	4,529,120
4,477,469	4,501,194	4,518,019	4,529,976
4,477,514	4,501,431	4,518,536	4,530,365
4,479,337	4,501,743	4,518,542	4,530,994
4,479,505	4,502,636	4,518,711	4,531,470
4,479,955	4,502,744	4,519,177	4,531,793
4,481,033	4,503,100	4,519,186	4,532,141
4,481,273	4,503,865	4,519,272	4,532,339
4,481,416	4,504,047	4,519,579	4,532,376
4,482,463	4,504,278	4,519,869	4,532,534
4,482,672	4,505,557	4,520,581	4,533,139
4,483,475	4,505,967	4,520,884	4,533,682
4,483,730	4,506,248	4,520,909	
4,484,050	4,506,632	4,521,052	
4,486,718	4,506,882	4,521,125	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 17, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-22-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-17-82
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	11-29-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	2-22-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-16-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,395,406 to 3,399,405, inclusive

Plant Patents . . . . . Numbers 2,825 to 2,829 inclusive

REEXAMINATIONS

OCTOBER 1, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1, Des.265,517 (393rd)
STORAGE CART
Richard S. Dunchock, Farmington Hills, Mich., assignor to SL Container Corporation, Southfield, Mich.
Reexamination Request No. 90/000,712, Jan. 23, 1985.
Reexamination Certificate for Patent No. Des. 265,517, issued Jul. 20, 1982, Ser. No. 145,891, May 2, 1980.
U.S. Cl. D34—17

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of the claim is confirmed.

1. The ornamental design for a storage cart, as shown.

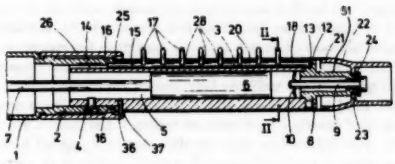
B1 4,327,753 (394th)
HAIR-CURLING IMPLEMENT
Ernst Bertschi, Winterthur, Switzerland, assignor to ICOMAG Trust Reg., Vaduz, Liechtenstein
Reexamination Request No. 90/000,569, Jun. 4, 1984.
Reexamination Certificate for Patent No. 4,327,753, issued May 4, 1982, Ser. No. 202,235, Oct. 30, 1980.
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2944050
Int. Cl.[4] A45D *2/00*
U.S. Cl. 132—40

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

New claim **11** is added and determined to be patentable.

1. A hair curler comprising:
a handle;
a tubular body mounted on said handle and extending therefrom while having an axis and being adapted to receive a heating element;
a plurality of combs formed with respective pivot rods



disposed about the periphery of said body and rotatable relative thereto, each of said combs having an array of teeth spaced therealong; and
a sleeve surrounding said body and said rods and formed with windows enabling said teeth to be erected through said windows upon relative rotation of said sleeve and said body in one sense and to be retracted to lie between said sleeve and said body upon relative rotation of said sleeve and said body in an opposite sense.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,993

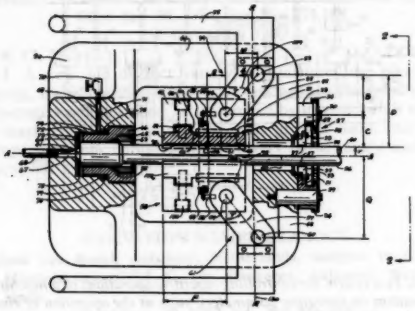
CYLINDER GRIPPING APPARATUS

William E. Wesch, Jr., P.O. Box 3938, Lone Star, Tex. 75668

Original No. 4,281,535, dated Aug. 4, 1981, Ser. No. 47,471, Jun. 11, 1979. Application for reissue Jul. 20, 1983, Ser. No. 515,546

Int. Cl.[4] G01M *3/28;* **B23B** *31/16*

U.S. Cl. 73—498 **74 Claims**



46. A member gripping apparatus for gripping a cylinder, pipe or solid bar having a predetermined cross sectional shape, comprising:

a jaw, said jaw having a friction surface adapted for gripping a member;

a body, said body being adapted to axially receive the member, said body having a front and rear;

an interfacing assembly, said interfacing assembly being interposed between said jaw and said body, said interfacing assembly being adapted to urge said jaw into gripping engagement with the member when said jaw is urged generally transverse with respect to said body, said interfacing assembly being adapted to provide a radial counterforce in response to a rotational force about the longitudinal axis of the member, said radial counterforce being proportional to said rotational force, said interfacing assembly adapted to move relative with said jaw and said body to permit transverse displacement of said jaw with respect to said body between an initial position and a displaced position said radial counterforce on the member created by said interfacing assembly and the contact area of said jaw friction surface being predetermined whereby said radial counterforce is less than the yield strength of the member.

Re. 31,994

INTAKE SYSTEM FOR MOTORCYCLE ENGINES HAVING V-SHAPED CYLINDER ARRANGEMENT

Nobuyoshi Tominaga, Hamamatsu; Nobuyoshi Kurai, Iwata; Hagime Ueno, and Sadahide Suzuki, both of Shizuoka, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

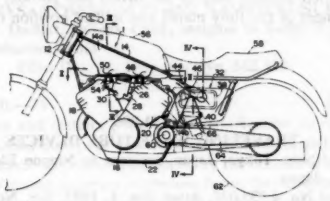
Original No. 4,321,978, dated Mar. 30, 1982, Ser. No. 57,268, Jul. 13, 1979. Application for reissue Nov. 26, 1982, Ser. No. 444,862

Claims priority, application Japan, Jul. 15, 1978, 53-86401

Int. Cl.[4] B62K *11/08, 19/30*

U.S. Cl. 180—225 **19 Claims**

1. A motorcycle comprising a frame, an engine mounted on said frame and including at least one fore cylinder and at least one aft cylinder which are arranged in a V-shaped configuration with a laterally-extending space therebetween, each cylinder having intake port means formed at a side facing into said space, carburetor means disposed in said space and connected with said intake port means in the cylinders, said frame having a closed cavity at least at a portion which is located above the engine, said frame being formed with inlet and outlet port means respectively leading into and out of the cavity, said outlet port means being connected with said carburetor means so that intake air is passed through the cavity in the frame to the carburetor means, and air filter means for passing therethrough the intake air before it is introduced into the closed



cavity, said air filter means being disposed behind the engine and mounted on the frame and said inlet port means of the frame is connected with said air filter means so that the intake air is passed from the air filter means through the cavity in the frame to the carburetor means, said air filter means being of a box type configuration having a side cover and a back wall which are connected together to constitute a closed box, said back wall being provided with air inlet and outlet ports and supporting an air filter element disposed between the inlet and outlet ports so that air is passed from said inlet port through the air filter element to the outlet port.

Re. 31,995

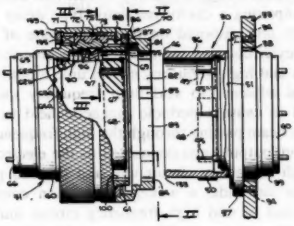
ENHANCED DETENT GUIDE TRACK WITH DOG-LEG

David J. Ball, Pacific Palisades, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Original No. 4,277,125, dated Jul. 7, 1981, Ser. No. 57,134, Jul. 12, 1979. Application for reissue Jan. 19, 1984, Ser. No. 571,918

Int. Cl.[4] H01R *13/639*

U.S. Cl. 339—113 R **8 Claims**



1. In an electrical connector having receptacle means including a receptacle shell; a plug means including a plug housing; a coupling nut threaded onto said plug housing, a coupling ring keyed to said coupling nut; electrical contact elements carried within said receptacle shell and said plug housing for electrical mating and unmating; lock means on said coupling ring and said receptacle shell for releasably holding said contact elements in mating relation; means for audibly indicating fully

mated and locked relationship of said receptacle means and plug means, said indicating means including an annular groove in said coupling ring, a keyway on said plug housing, and an arcuate spring detent in said annular groove and having a key engaged in said keyway, said detent having radially outwardly directed end portions carried by resilient arcuate arms which are bent when the end portions thereof are between spaced sets of radially outwardly directed recesses in said annular groove during turning of said coupling housing, whereby said end portions snap into a set of recesses to produce an audible sound to indicate fully locked or unlocked position of the receptacle means and plug means, the improvement comprising: an enlarged portion defining a dog-leg in said keyway in the path of axial travel of said plug housing whereby said key [makes audible contact with a terminating wall of said dog-leg] *is released from contact with the plug housing* so as to produce an intensified audible snap *of the detent end portions* indicating attainment of the fully mated and locked position of the connector.

Re. 31,996

TRAVELING WAVE TUBE DEVICES

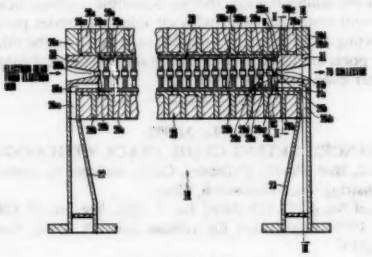
Hisaaki Sato, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Original No. 4,333,038, dated Jun. 1, 1982, Ser. No. 137,799, Apr. 7, 1980. Application for reissue Sep. 29, 1982, Ser. No. 427,482

Claims priority, application Japan, Apr. 11, 1979, 54/44027; Apr. 13, 1979, 54/45723

Int. Cl.[4] H01J *25/34*

U.S. Cl. 315—3.5 **10 Claims**



1. In a traveling wave tube of the type provided with an electron gun, a high frequency circuit unit connected thereto and comprising a cavity resonator type delay circuit unit, a collector unit disposed on the output side of the said high frequency circuit unit and adapted to receive an electron beam sent via said high frequency circuit unit, a beam focusing unit disposed adjacent to said high frequency circuit unit and adapted to cause a periodic magnetic field to act upon the electron beam passing through the high frequency circuit unit, and input/output units connected to the electron gun side of said high frequency circuit unit and the end portion of the collector unit side, a waveguide portion connected to the output unit of said high frequency circuit unit comprises a column-shaped waveguide member having an end surface forming a portion of the wall of a cavity at the end of the high frequency circuit unit, said member being bored with a central aperture at a central axis to allow the passage of the electron beam from the electron gun to the collector unit, said central aperture is tapered and its diameter increases towards the collector unit, and a waveguide for transmitting the electromagnetic waves from said end surface to the output unit, said end surface of the waveguide being shaped like a fan.

Re. 31,997

INPUT-OUTPUT UNIT FOR A MICROPROCESSOR ENGINE CONTROL SYSTEM

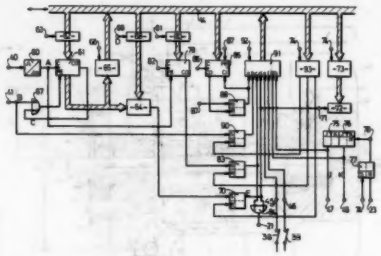
Winfried Klötzner, Maulbronn-Schmie, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 4,204,256, dated May 20, 1980, Ser. No. 916,827, Jun. 19, 1978. Application for reissue May 20, 1982, Ser. No. 380,340

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732781

Int. Cl.[4] G06F *15/20;* **G05B** *15/02;* **F02D** *5/02*

U.S. Cl. 364—431.12 **19 Claims**



16. In a system for controlling repetitive operations of a machine dependent on operating parameters, such as the operation of electrical ignition in an internal combustion engine, which system comprises a microprocessor, a clock pulse generator, a read-only memory (ROM, PROM), a random access memory (RAM), a data bus and an address bus, both interconnecting said microprocessor with said read-only memory and said random access memory, and read and write enable connections for enabling the reading of said memories and writing into said random access memory the data on said data bus at the memory address specified on the said address bus,

an input-output unit for said system connected to said address bus and read and write connections including a decoding circuit (100), connected to said data bus, and connected to said microprocessor also through "clear" and "interrupt" connections for receiving a clearing command from said microprocessor and for providing an interrupt to said microprocessor, said input-output unit comprising:

means for communicating reference mark signals (B) derived from operation of said machine to said microprocessor through said data bus (14) for synchronizing signals of a control signal sequence (F) determined by said microprocessor and furnished to said decoding circuit (100) of said input-output unit through said data bus (14),

said decoding circuit (100) being constituted so as to provide stepwise control of the various circuit components connected with said data bus (14) as selected over said address bus (15);

a timing circuit (85,88) comprising a first counter for counting at a predetermined counting frequency and arranged for being supplied a count content from said data bus (14) in response to an enabling signal from an output (87) of said decoding circuit (100) for use of said count content as a number from which down counting is performed by said counter;

a second counter (112) which is arranged for being supplied with at least one magnitude value of an operating parameter of said machine in the form of a frequency supplied as a counting frequency and which is arranged to have its counting time prescribed by said timing circuit (85,88), and furthermore, is arranged so that its count result is transferable through a gate stage (113) to said data bus (14), and

a frequency selection decoder stage (119) and a frequency selecting circuit (117) controlled through said frequency selection decoder stage in response to an output (74) of said decoding circuit (100), whereby said predetermined counting frequency is subject to being varied over said data bus.

PLANT PATENTS

GRANTED OCTOBER 1, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,564
MINIATURE ROSE PLANT—FAIR DINKUM

Cecelia L. D. Bennett, 489 Minot Ave., Chula Visat, Calif. 92010

Filed Jan. 30, 1984, Ser. No. 575,188
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its pink petals with a deeper pink margins and vigorous growth habit, easy to propagate from cuttings, with flowers borne singly and in aprays of 3 to 5 or more.

5,565
CARNATION NAMED STANOCT

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij/M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,263
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct carnation cultivar, substantially as herein shown and described, characterized by its continuous production of bright red/purple blossoms of small size borne singly on rigid, erect pedicels.

5,566
CHRYSANTHEMUM PLANT NAMED JOY

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Dec. 16, 1983, Ser. No. 562,288
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Joy, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat and spooned capitulum form; anemone capitulum type; white ray floret color; diameter across face of capitulum ranging from 5 to 7 cm. at maturity; uniform 8 to 9 week flowering response; medium plant height; spreading, branching pattern; and uniform, 11 hour short day response to 24° C. night and 38° C. day temperatures under high light conditions.

5,567
CHRYSANTHEMUM PLANT NAMED SUNUP

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Dec. 16, 1983, Ser. No. 562,229
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Sunup, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of round pompon capitulum form; formal decorative capitulum type; organge red ray floret color; diameter across face of capitulum ranging from 55 to 65 mm. at maturity; uniform eight week flowering response; medium plant height when grown single stem; 12 to 18 cm. peduncles on open, normally terminal sprays; and 13° C. minimum temperatures tolerance for initiation and development of flowering buds.

5,568
CHRYSANTHEMUM PLANT NAMED DAWN

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Dec. 16, 1983, Ser. No. 562,289
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Dawn, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of round pompon capitulum form; formal decorative capitulum type; yellow orange ray floret color; diameter across face of capitulum ranging from 55 to 65 mm. at maturity; uniform eight week flowering response; medium plant height when grown single stem; 12 to 18 cm. peduncles on open, normally terminal sprays; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

PATENTS

GRANTED OCT. 1, 1985

ERRATA

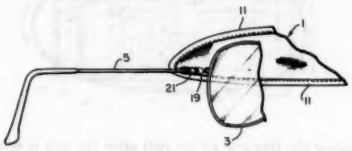
For CLASS	See PATENT NO.
623–006	4,543,673
400–110	4,544,276
523–115	4,544,359
030–216	4,544,366
204–059	4,544,450
514–023	4,544,552
514–092	4,544,553
514–263	4,544,556
514–210	4,544,557
252–522	4,544,714
369–043	4,545,003
362–329	4,545,007

PATENTS

GRANTED OCTOBER 1, 1985

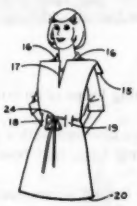
GENERAL AND MECHANICAL

4,543,667
SUN VISOR
Valerie Garbutt, 762 E. Fairview Ave., Annapolis, Md. 21403
Filed Sep. 19, 1984, Ser. No. 651,960
Int. Cl.[4] A61F *9/04*
U.S. Cl. 2—13 **2 Claims**



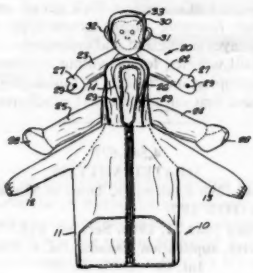
1. A sun visor for attachment to a pair of eyeglasses, comprising:
(a) a bill member having a substantially flat, rigid stiffening member and being formed with a substantially concave inner edge and a substantially convex outer edge, said edges meeting at each side of the bill;
(b) a top and a bottom material covering the top and bottom surfaces of said rigid stiffening member and having generally the same shape as said rigid stiffening member;
(c) an outer ribbon of material folded over the outer edges of said bill member and being secured thereto;
(d) the improvement comprising: a pair of loops of elastic material independently mounted between said ribbon and said bottom material on the underside of said bill adjacent said sides where said edges meet; and said outer ribbon being stitched with thread to said bill and said loops are stitched to said bill between said ribbon and bottom material.

4,543,668
DISPOSABLE TORSO COVERS
Marilyn L. Franklin, 10311 Colorado Cir., Bloomington, Minn. 55438
Continuation-in-part of Ser. No. 507,282, Jun. 23, 1983, abandoned. This application Mar. 2, 1984, Ser. No. 585,841
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—48 **23 Claims**



1. As a new article of manufacture: a disposable torso cover consisting of a rectangular shape of sheet material, said rectangular shape consisting solely of a single layer thickness of said sheet material throughout the entire expanse of said rectangular shape and having within the rectangular shape an interior severance line in the shape of a T, said T-shaped interior severance line having no part thereof extending to any edge of said rectangular shape and being openable as a T-shaped opening for a head to pass therethrough, said T-shaped interior severance line having its crossbar portion spaced from and extending in a direction parallel with one of the narrower sides of said rectangular shape and having its depending stem portion approximately equally spaced from and parallel to each of the longer side edges of said rectangular shape, said longer side edges having nor part thereof connected to any other part thereof, said portion of said rectangular shape at each end of the crossbar portion of the T being functionable as an over-shoulder covering, said portion of said rectangular shape on each side of the stem of the T being functionable as a front upper torso covering, said portion of said rectangular shape below the stem of the T being functionable as a front torso covering, and said portion of said rectangular shape between the crossbar of the T and said one narrower side being functionalbe as a depending yoke backing across the back of a user with its sole connection to the remaining expanse of said rectangular shape located at said over-shoulder portion.

4,543,669
COMBINATION TOY AND GARMENT
Robert F. Katz, 1401 Manzanita St., Manhattan Beach, Calif. 90266
Filed Mar. 26, 1984, Ser. No. 593,560
Int. Cl.[4] A41D *10/00*
U.S. Cl. 2—84 **6 Claims**



1. A combination toy and garment comprising a toy portion and a garment portion attached together to form an article of clothing having a hood; said toy portion comprising a trunk having at least one appendage and at least one head attached to said trunk; said trunk forming a part of said hood such that when said garment portion is enfolded by said toy portion the combination takes the shape of a stuffed doll and when said article of clothing is being worn said head sits on the top of said hood; and said toy portion further comprises a fastening means attached to said trunk such that when said garment portion is enfolded by said toy portion said shape of a stuffed doll is maintained by engaging said fastening means.

4,543,670
SLEEVE ATTACHMENT FOR MULTILAYERED PROTECTIVE COAT
Carolyn C. Ehring, West Caldwell, N.J., assignor to Cairns & Brother Inc., Clifton, N.J.
Filed Sep. 18, 1984, Ser. No. 651,801
Int. Cl.[4] A41D *3/02*
U.S. Cl. 2—85 **9 Claims**

1. In a multilayered protective coat for firefighters, an improved sleeve attachment comprising:
an outer shell sleeve having a first fastening strip circumferentially secured to an inner surface thereof;
a cuff assembly including an annular cuff layer secured to

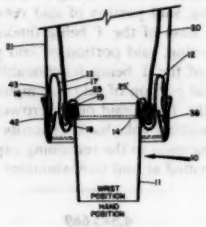
said inner surface of said outer shell sleeve and forming an innersleeve alignment groove therebetween;

a thermal layer sleeve positioned within said outer shell sleeve; and

a detachable, innersleeve wristlet assembly including:

a wristlet comprised of thermal insulative material;

an innersleeve comprised of thermal, insulative material, said innersleeve having a first open end thereof secured to said wristlet, said innersleeve being folded about itself to form a plurality of annular layers;



a second fastening strip circumferentially secured to an outer annular layer of said plurality of annular layers, said outer annular layer being partially positioned within said innersleeve alignment groove to align said second fastening strip with said first fastening strip to provide a first circumferential attachment between said innersleeve and said outer shell sleeve; and

flexible tab fastening means connectible between said thermal layer sleeve and said innersleeve, in the proximity of said wristlet, for providing an expansion limit to the telescoping movements of said innersleeve so as to retain said first circumferential attachment.

4,543,671

HEATED MITTEN

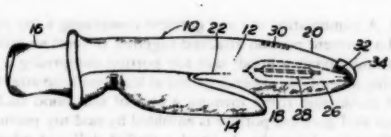
Peter H. Monk, 1290 Kenilworth, Town of Mount-Royal, Quebec, Canada (H3R 2R7)

Filed May 31, 1984, Ser. No. 615,571

Claims priority, application Canada, Jul. 6, 1983, 431887

Int. Cl.[4] A41D *00/00*

U.S. Cl. 2—158 **4 Claims**



1. A mitten comprising:

a body portion having an opening at its end proximate the location of the fingers of a hand to be inserted therein;

a pouch disposed within said opening in the interior of said body portion of said mitten, said pouch being supported by said mitten so as to be movable relative to the hand of a user such that said mitten does not interfere with an object being gripped by said user, and

means for sealing said pouch with a snap or sliding action.

4,543,672

BELT CONSTRUCTION

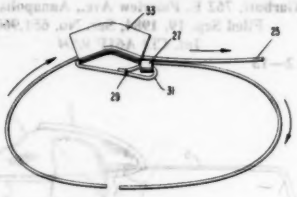
Ellen R. Levy, 136 Waverly Pl., New York, N.Y. 10014

Filed Jan. 7, 1983, Ser. No. 439,580

Int. Cl.[4] A41F *9/00*

U.S. Cl. 2—321 **15 Claims**

1. A belt or other band-like article adapted to be wrapped around a user's waist, hips or other body part and secured in place, said belt comprising a length of material having a rear side which faces the user's body part and a front side which faces away from the user's body part when the belt is in place, said belt having one free end, means at the other end of said belt retaining a loop at the front side of said belt and extending outwardly thereof, said loop being sized and constructed to



freely receive the free end of the belt after the belt is wrapped around the user's waist, hips or other body part, and to freely receive the free end of the belt's a second time after the free end is passed under and around the belt beyond the loop, whereby to tie a knot in the belt.

4,543,673

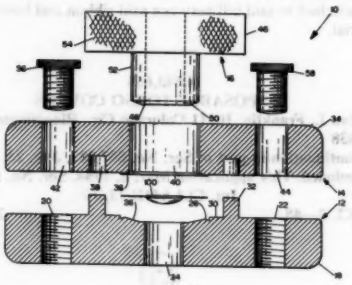
VAULTED INTRAOCULAR LENS

Anthony F. Drake; Fernard J. Masse, and Dennis T. Grendahl, all of Santa Barbara, Calif., assignors to Surgidev Corporation, Goleta, Calif.

Filed Jun. 3, 1983, Ser. No. 500,766

Int. Cl.[4] A61F *1/16, 1/24;* **B29D** *11/00*

U.S. Cl. 623—6 **6 Claims**



3. Process for vaulting loops of an intraocular lens comprising the steps of:

a. supporting an intraocular lens with a plurality of outwardly extending loops on a base, said base including a vaulting surface;

b. securing a retainer having a complementary corresponding geometrical configuration to said base, said lens secured between said base and said retainer;

c. supporting a cap down through a hole in said retainer, said cap having a hole for accommodating said lens, said cap also including a vaulting surface for mating with said vaulting surface of said base for providing a vault in said loops;

d. submersing said fixture of said base, said retainer, and said cap in a bath of hot liquid for a predetermined time interval; and,

e. separating said retainer and said cap from each other for freeing said lens, whereby said loops of said lens are provided with a predetermined vault.

4,543,674

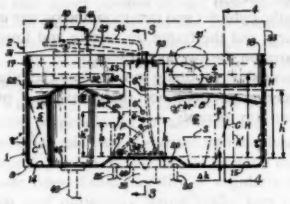
WATER SAVING INSERT FOR TOILET TANK

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Aug. 27, 1984, Ser. No. 644,786

Int. Cl.⁴ E03D *1/00*

U.S. Cl. 4—415 **14 Claims**



1. A toilet tank insert comprising:

means for raising the center of gravity of the mass of water to be flushed out of the toilet tank during the flushing operation of an existing toilet tank in which said insert has been installed;

means for considerably reducing the total amount of water flushed during a normal flushing cycle as compared to the amount of water so flushed from the same toilet tank before said insert is installed, by eliminating most of the water stored in the lower internal volume of an existing toilet tank;

means for positioning and securing said insert inside the toilet tank;

means for transferring the hydraulic loads generated on the insert walls by the water inside said insert onto the toilet tank bottom and side walls;

means for preventing water from reaching and coming in contact with the tank bottom and side walls, thus causing said insert to be watertight;

means for isolating the head of the bolts fastening the toilet tank from water, thereby providing said bolt heads with protection therefrom; and

wherein the structural damage and cracking of the toilet tank walls do not cause water to leak from inside the toilet tank, all of said water being contained inside said watertight insert.

4,543,675

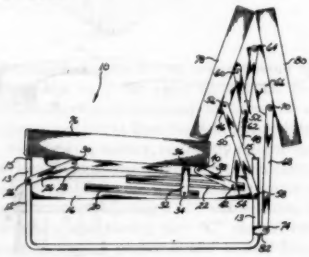
VEHICLE SEAT-BED EXTENDER

Fred J. Shrock, 55068 Phillips, Elkhart, Ind. 46515

Filed Feb. 6, 1984, Ser. No. 577,334

Int. Cl.⁴ A47C *17/04*

U.S. Cl. 5—37 R **4 Claims**



1. A convertibe seat-bed assembly comprising a base frame, a seat support for supporting a seat cushion, a back support for supporting a back cushion, and an extender support for supporting a bed cushion, first linkage means connected between said frame and seat and back supports for supporting the seat and back supports for movement between a seat position wherein the seat support is generally horizontal and the back support is generally vertical and a bed position wherein the seat and back supports are horizontal, said first linkage means connected to said extender support, and second linkage means connected between said frame and said extender support for supporting the extender support in conjunction with said first linkage means for movement between a generally vertical position when said back support is in its seat position and a horizontal position aligned with said seat and back supports when the back support is in its bed position.

4,543,676

METHOD OF LIQUID TREATMENT OF TEXTILE FIBER MATERIAL

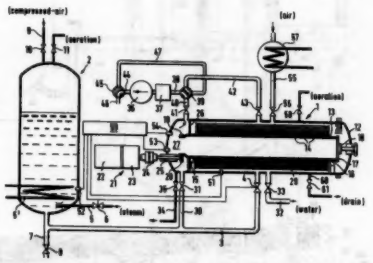
Fritz Karrer, Strandvägen 37, 11456 Stockholm, Sweden

Filed Aug. 22, 1983, Ser. No. 525,611

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231578

Int. Cl.⁴ D06B *5/06*

U.S. Cl. 8—149.1 **12 Claims**



1. A method of liquid treatment of textile fiber material or the like, in particular of dyeing yarn, loose material, or textile pieces, with which the fibrous material is put into a vat, the vat is evacuated until dry, the treatment liquid is introduced into the vat, the treatment liquid is caused to act on the fibrous material for a certain period of time, the treatment liquid is withdrawn from the vat, and the fibrous material is dried in the vat, if desired, after rinsing, characterized in that the liquid is introduced into the vat under vacuum conditions, and prior to introducing the treatment liquid into the vat the temperatures of the fibrous material and of the treatment liquid as well as the pressure inside the vat are harmonized so that substantially no evaporating liquid will condense in or on the fibrous material as the treatment liquid is introduced.

4,543,677

AIRTIGHT TELESCOPING RIGID CONDUIT

Richard A. Haglund, Hawthorne, and Robert E. Tupack, Hermosa Beach, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 9, 1984, Ser. No. 598,808

Int. Cl.⁴ E01D *1/00;* **F16L** *9/22*

U.S. Cl. 14—71.5 **4 Claims**

1. Telescoping rigid conduit, comprising:

a first section of rigid tubing;

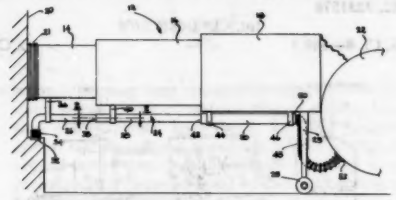
a scond section of rigid tubing having an outside diameter which is less than the inside diameter of the first section, whereby one end of the second section fits within one end of the first section, forming an annular space between the inner surface of the first section and the outer surface of the second section, where the width of the annular space is one-half the difference between the inside diameter of the first section and the outside diameter of the second

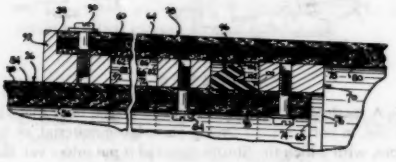
section, and where the first and second sections of rigid tubing are each formed of a layer of heat insulating foam sandwiched between two layers of fiber reinforced plastic;

a first bearing in the shape of a first ring which is affixed around the outer surface of the second section adjacent the one end of the second section, in which the thickness of the first ring is slightly less than the width of the annular space, and in which the outer surface of the first ring is sufficiently smooth to slide freely along the inner surface of the first section;

a second bearing in the shape of a second ring which is affixed around the outer surface of the second section at a predetermined distance from the first bearing, in which the thickness of the second ring is slightly less than the width of the annular space, and in which the outer surface of the second ring is sufficiently smooth to slide freely along the inner surface of the first section;

a third bearing in the shape of a third ring which is affixed to the inner surface within the first section adjacent the one





end of the first section, in which the thickness of the third ring is slightly less than the width of the annular space, and in which the inner surface of the third ring is sufficiently smooth to slide freely along the outer surface of the second section; and

a resilient seal formed in the shape of a seal ring having a generally V-shaped cross-section, where the outside surface of one leg of the V forms the inner surface of the seal ring which is positioned around the outer surface of the second section between the first and second bearings, where the width of the one leg of the V is approximately equal to the predetermined distance, where the open end of the V is oriented toward the first bearing, and where the other leg of the V extends into contact with the inner surface of the first section, whereby pressurized gas flowing through the first section into the second section is prevented from leaking out of the first section by the V-shaped resilient seal ring, which expands to seal the annular space in response to the force generated by the pressurized gas.

4,543,678

FEEDYARD SWEEPER

Hoy L. Cox, 1319 Mann, Larned, Kans. 67550

Filed Mar. 8, 1984, Ser. No. 587,665

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—56 **6 Claims**

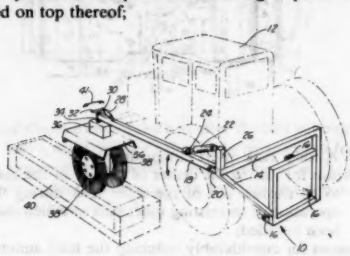
1. A feedyard sweeper for sweeping and cleaning animal feed bunks, the sweeper mounted on a vehicle such as a tractor and the like, the sweeper comprising:

a sweeper frame having pin connecting brackets for mounting on a three-point hitch on the rear of the tractor;

a sweeper arm pivotally mounted on one side of the sweeper frame and extending outwardly therefrom and toward the front of the tractor;

a first hydraulic cylinder and ram mounted on one end of the sweeper arm and the frame for raising and lowering the sweeper arm on the sweeper frame;

a vertical pivot shaft pivotally mounted on the other end of the sweeper arm, the pivot shaft having a pivot arm mounted on top thereof;



a broom frame mounted on the bottom of the pivot shaft and having a horizontal drive motor mounted thereon;

a horizontal broom drive shaft rotatably mounted on the bottom of the frame, the drive motor and broom drive shaft connected by an endless chain, the horizontal broom drive shaft receiving on opposite ends of the shaft annular shaped brooms vertically disposed thereon for cleaning the sides and bottom of the feed bunk; and

a second hydraulic cylinder and ram mounted on the other end of the sweeper arm, the ram connected to the pivot arm for pivoting the vertical pivot shaft and the brooms mounted on the horizontal drive shaft.

4,543,679

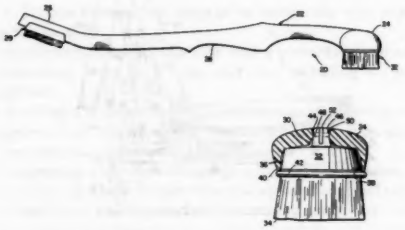
TOOTHBRUSH ASSEMBLY COMBINING A HANDLE WITH A REPLACEABLE BRUSH ASSEMBLY AND A REPLACEABLE ORAL HYGIENE DEVICE

Paul M. Rosofsky, Willingboro, N.J., and Alfred M. Blumenfeld, Melrose Park, Pa., assignors to Oral Ease Inc., Willingboro, N.J.

Filed Oct. 8, 1982, Ser. No. 433,424

Int. Cl.[4] A46B *9/04;* **A47L** *1/08, 13/12*

U.S. Cl. 15—110 **18 Claims**



16. A handle for a toothbrush comprising:

a head end having a head end recess formed therein shaped for releasable engagement with a base carrying bristles;

a tail end having a portion thereof shaped for releasable engagement with an oral hygiene device; and

a region intermediate said head end and said tail end shaped for engagement by a user of the toothbrush;

wherein said head end recess has a bottom opening and a top opening, portions of the head end defining an upper portion of the head end recess being shaped for engagement with an upper portion of the base;

wherein said upper portion of said base has an upper part which outwardly flared, and said top opening of said head end recess has an upper portion which is outwardly flared and an intermediate portion which is inwardly tapered, said upper portion of said base being further provided with a plurality of angularly oriented slots extending in a direction perpendicular to said base; and

wherein, when said base is inserted into said head end recess, said upper portion of said base is laterally compressed on opposite sides of said plurality of angularly oriented slots so that said outwardly flared upper part of said upper portion of said base clears said inwardly tapered intermediate portion of said top opening of said head end recess;

whereby said upper portion of said base is inserted firmly in said top opening of said head end recess in such a manner that it is restrained in a plurality of lateral directions corresponding to the angular orientations of said plurality of angularly oriented slots.

4,543,680

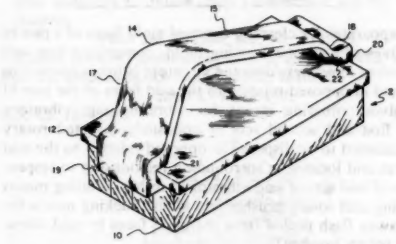
BLACKBOARD ERASER HANDLE

Stephanie A. Vlahos, 3517 Winway, San Mateo, Calif. 94403

Filed Jan. 18, 1984, Ser. No. 571,810

Int. Cl.[4] A47L *13/16*

U.S. Cl. 15—145 **14 Claims**



1. A detachable handle for an eraser having an absorbing material attached to a flat rigid rectangular backing plate having edgewalls of predetermined thickness and used to erase chalk or grease pen marks from black boards, white boards and the like, comprising a unitary, resiliently rigid structure having a predetermined transverse width and a predetermined longitudinal length related to the width and length of said backing plate, said structure including a "C" shaped strap in the longitudinal direction and having two "C" shaped notches along opposite edges thereof perpendicular to said longitudinal direction and disposed to face one another for overlying clamping engagement with opposite edgewalls of said rigid backing plate and wherein the untensioned longitudinal dimension between the interior endwalls of said notches is slightly less than the dimension of said backing plate between said engaged edgewalls thereof, said handle structure being under tension when engaged on said eraser.

4,543,681

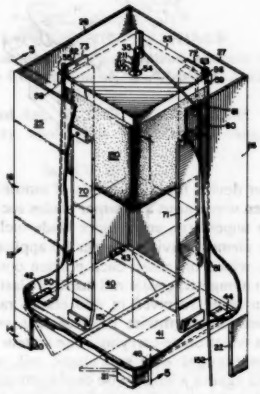
REMOTELY OPERATED CHIMNEY CLEANING APPARATUS

David M. Ryden, Box 391, Hallock, Minn. 56728

Filed Mar. 9, 1984, Ser. No. 588,089

Int. Cl.[4] F23J *3/00*

U.S. Cl. 15—163 **7 Claims**



1. Chimney cleaning apparatus, comprising:

a frame and means for mouunting said frame to the top of a chimney, said frame enclosed to provide a housing on the top part thereof and including openings on the bottom part thereof for venting chimney effluents;

pulley means mounted for free rotation near the top center of said housing;

chimney sweeping means suspended by a cable passing through an opening in said housing and running over said pulley means, said cable accessible from a remote location for moving said sweeping means up and down the chimney flue for cleaning thereof, said sweeping means stowable inside said housing when not in use; and

bottom door means connected to said housing with hinges for selectively covering the bottom opening in said housing to substantially seal the interior of said housing from chimney effluent when said chimney sweeping means is stored in said housing, said hinges mounted between said door means and said housing so that when said door means is in the closed position said hinges are substantially sealed within said housing.

4,543,682

WINDSHIELD WIPER DEVICE FOR MOTOR VEHICLES

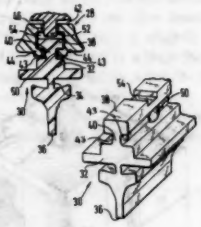
Peter-Jürgen Kessler, Sasbach; Jürgen Mayer, Gaggenau, and Paul Weiler, Kappelrodeck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,564

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318425

Int. Cl.[4] B60S *1/04, 1/38*

U.S. Cl. 15—250.42 **14 Claims**



1. A wiper device for windshields of motor vehicles, comprising driven wiper arms and wiper blades each connected to a respective wiper arm, each wiper blade including an elongated wiper element having a wiper lip applied onto a windshield to be wiped off and a back portion connected to said wiper lip, an elongated elastic rail made of elastic plastics, said back portion being received in said elastic rail and secured therein against a lengthwise displacement relative to said elastic rail, a wiper blade-carrying yoke system having at least two portions engaged with said elastic rail, said elastic rail being secured against a lengthwise displacement relative to the yoke system, and means for connecting said yoke system to the respective wiper arm, said yoke system including a yoke element formed with a pin, said elastic rail being formed with an insertion bore receiving said pin, said wiper element being formed with a recess, said pin passing through said insertion bore and extending into said recess, said wiper element further including a body portion connected to said lip, and a neck portion extended between said body portion and said back portion and formed to provide grooves between said back portion and said body portion, said elastic rail including two claw-shaped portions which surround said neck portion whereby said claw-shaped portions are engaged in said grooves, and a cross-piece connected with said claw-shaped portions, said bore being formed in said cross-piece and extended into said claw-shaped portions so that a recess is formed in each of said claw-shaped portion, said neck portion having two opposite lateral faces facing said claw-shaped portions and each formed with a projection engaged in the respective recess formed in each claw-shaped portion.

4,543,683

DEVICE FOR CLEANING STAYS

Scott M. Goldman, 14035 Tahiti Way, #232, Marina del Rey, Calif. 90272

Filed May 17, 1984, Ser. No. 611,485

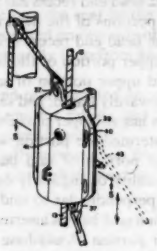
Int. Cl.[4] B63B *59/00*

U.S. Cl. 15—256.6 **10 Claims**

1. A device for cleaning a stay or the like comprising in combination:

a. a cleaning unit housing adapted to be moved up and down along the length of said stay in substantially fixed angular position with respect to the axis thereof; and;

b. a cleaning unit including stay cleaning means adapted to clean said stay, said cleaning unit being mounted in said housing for free angular rotation around the axis of said stay, said cleaning unit comprising stay cleaning means adapted to contact the wind of said stay in cleaning relationship such that said cleaning unit is free to rotate around the axis of said stay when said cleaning unit housing is moved along the length thereof in said fixed angular



position whereby said stay will be cleaned by said cleaning unit.

4,543,684

APPARATUS FOR CLEANING PLASTICS FORMING MOLD FACES

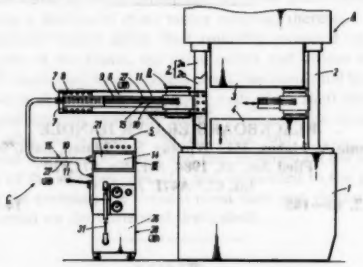
Kazuo Bandoh, No. 81-8, Toyama, Momoyama-choFushimi-ku, Kyoto-shi, and Michio Osada, No. 6-197, 3-chome, Myojyo-choUji-shi, Kyoto-fu, both of, Japan

Filed Oct. 18, 1983, Ser. No. 543,137

Claims priority, application Japan, Oct. 25, 1982, 57-187830

Int. Cl.[4] A47L *5/02*

U.S. Cl. 15—309 **7 Claims**



1. An apparatus for cleaning opposed mold faces of a pair of mold halves of a plastic forming mold, comprising first and second sets of oppositely directed vibratory brushes adapted to be disposed in opposed relation to the said faces of the pair of mold halves, vibrating means for vibrating said vibratory brushes, first and second sets of oppositely directed rotary brushes adapted to be disposed in opposed relation to the said mold faces and located in surrounding relationship to respective ones of said sets of said vibratory brushes, rotating means for rotating said rotary brushes and a flash sucking means for sucking away flash peeled from the mold faces by said vibratory and rotary brushes.

4,543,685

CASTER

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Jul. 12, 1984, Ser. No. 630,219

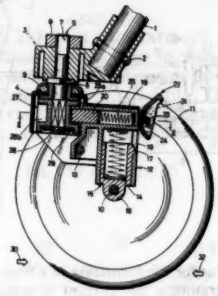
Claims priority, application Japan, Jul. 22, 1983, 58-134951

Int. Cl.[4] B60B *33/02*

U.S. Cl. 16—35 R **6 Claims**

1. A caster having a fixed bracket (3) secured to an object (101) to be moved by said caster, a rotary bracket (4) supported for rotation around a fixedly installed vertical shaft (5) vertically extending from said fixed bracket (3), and a wheel (11) rotatably supported with respect to said rotary bracket (4) on an axle (10) horizontally spaced from the axis of said vertical shaft (5), said caster comprising a wheel attaching member (12) which supports the axle (10) of said wheel (11) is turnably attached to said rotary bracket (4) by a horizontally directed pivot shaft (13) positioned between said vertical shaft (5) and

said axle (10); said rotary bracket (14) comprising a stopper (19) which when said wheel attaching member (12) is turned around the axis of said pivot shaft (13), defines the terminal end of the upward movement of said wheel (11); a key member (20) movable toward said vertical shaft (5) installed in said wheel attaching member (12) at a position above said pivot shaft (13); the outer surface of said vertical shaft (5) including at least one fitting recess (29*a*, 29*b*) into which said key member fits as it is moved with at least one predetermined angle obtained by the rotation of said rotary bracket (4) around said vertical shaft (5);



wherein the arrangement is such that when said key member (20) fits in said fitting recess (29*a*, 29*b*), the rotation of said rotary bracket (4) around said vertical shaft (5) is inhibited and, wherein in this inhibited state when a force greater than a predetermined value is applied to said wheel attaching member (12) in a direction to move said wheel (11) downwardly, said wheel attaching member (12) is turned in this direction, with the key member (20) escaping from said fitting recess (29*a*, 29*b*), thereby allowing the rotation of said rotary bracket (4) around said vertical shaft (5).

4,543,686

FURNITURE HINGE HAVING A SPRING BIASED PIVOTING PRESSURE MEMBER

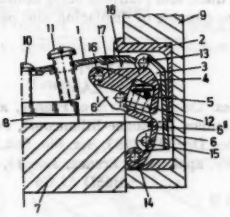
Erich Röck, Höchst, and Klaus Brütle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jul. 7, 1983, Ser. No. 511,749

Claims priority, application Austria, Jul. 16, 1982, 2775/82; Apr. 22, 1983, 1484/83; May 3, 1983, 1610/83

Int. Cl.⁴ E05F *1/12*

U.S. Cl. 16—288 **7 Claims**



1. A furniture door hinge including a closing mechanism, said hinge comprising:

a hinge casing adapted to be mounted on a door;

a hinge arm adapted to be mounted on a furniture wall;

inner and outer hinge links having respective first ends pivotally mounted to said hinge casing by respective outer hinge axles and respective second ends pivotally mounted to said hinge arm by respective inner hinge axles, thereby forming a quadrangular linkage;

said inner hinge link being in the form of a two-arm lever including a first arm extending between the respective said outer and inner hinge axles and a second arm extending from said respective inner hinge axle in a direction away from said respective outer hinge axle;

said hinge arm having a guide surface;

a pressure member extending between the inner hinge axles and being directly pivotally mounted on an axle fixed to said second arm at a position spaced from said respective inner hinge axle, said pressure member having a contact surface; and

separate spring means for biasing said pressure member to pivot about said axle in a direction to urge said contact surface into direct abutment with a surface on the respective said inner hinge axle of said outer hinge link and in a direction toward said respective inner hinge axle of said outer hinge link in the closed position of the hinge and to urge said contact surface directly against said guide surface at all other positions of the hinge, said spring means comprising a compression coil spring compressed between said first arm and said pressure member.

4,543,687

TAPERED NESTING HINGE

David Law, Whangaparaoa, New Zealand, assignor to Development Finance Corporation of New Zealand, Auckland, New Zealand

Filed Aug. 15, 1983, Ser. No. 523,283

Claims priority, application New Zealand, Aug. 27, 1982, 201749

Int. Cl.⁴ E05D *5/02*

U.S. Cl. 16—388 **1 Claim**

1. A hinge having a pair of leaves that are pivotally interconnected for relative swinging movement by a removable pivot pin, one leaf being an outer leaf and having a pair of tubular portions at each end thereof for reception of said pivot pin and having a central cut out area for the reception of the other leaf which is an inner leaf having an inner tubular portion disposed between the tubular portions of said pair of tubular portions for reception of said pivot pin, the inner leaf fitting completely within the cut-out in the outer leaf when the hinge is closed, wherein the inner leaf does not extend beyond the outer leaf in any direction so as to present only a one leaf thickness when the hinge is closed, the thickness of the leaves decreasing progressively in a direction away from said pivot pin, said outer leaf having beveled edges about the perimeter of said cut out area that contact oppositely disposed beveled edges around the outer perimeter of said inner leaf, only said beveled edges of said inner and outer leaf fitting and abutting against each other when the hinge is closed, whereby the hinge can close to a one leaf thickness in only one orientation.

4,543,688

ANIMAL SKINNING HOLDER

Oscar W. Barchus, R.R. 1, Box 296, Bourbon, Mo. 65441

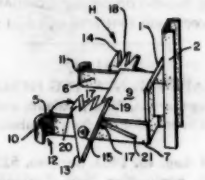
Filed Jan. 30, 1984, Ser. No. 575,055

Int. Cl.⁴ A22C *15/00*

U.S. Cl. 17—44.3 **1 Claim**

1. An animal skinning holder including a bracket means adapted for stable securement to any supporting surface, a pair of arms extending forwardly of the bracket means, said arms being spaced apart, each arm having an integrally formed clamp extending forwardly and laterally thereof, each clamp incorporating an arcuate shape and extending laterally of the arm for reception of an animal part therein during a skinning operation, a pair of ratchet jaws, one of each ratchet jaw pivotally mounting to an arm, one of said clamps being arranged forwardly of each ratchet jaw with each clamp and jaw combination disposed for holding a part of the animal in place, each ratchet jaw disposed for achieving a wedging insertion within its associated clamp during application, each ratchet

jaw having a pivotal movement between an upright and non-wedging position into a downward and forward movement for wedging an animal part in place during a skinning operation, each ratchet jaw having a serrated clamping edge, formed of reducing radius to facilitate the tight wedging of an animal part in place, the inner arcuate surface of each clamp incorporating means for facilitating the gripping of any animal part therein, means operatively associated with each jaw to limit the extent of pivot of the jaw during its application, said ratchet jaws being pivotally mounted to the arms and being disposed for vertical pivoting into an upper entrance into their respective clamps for their wedging securement of an animal part therein,



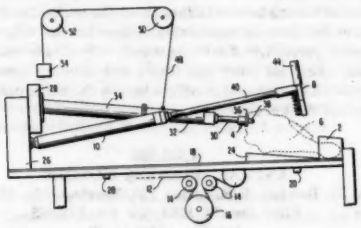
a rod provided upon each ratchet jaw and being exposed for grasping when forcing a ratchet jaw into position for wedging an animal part within the associate arm clamp, the interior of each clamp facing towards its associated ratchet jaw including grooved means for facilitating the gripping of any animal part therein, a pin associated with each arm and provided for limiting the extent of pivot of each jaw during usage, a base plate operatively associated with the bracket means and designed for removably mounting of the holder to a supporting surface, and support means arranged intermediate the extending arms to structurally reinforce and function as a tray during usage.

4,543,689

METHOD AND APPARATUS FOR REMOVING CHEEK MEAT FROM THE SKULLS OF SLAUGHTERED ANIMALS

William F. Couture, Amarillo, Tex., assignor to IBP, Inc., Dakota City, Nebr.

Filed Aug. 1, 1983, Ser. No. 519,479
Int. Cl.[4] A22C *17/02*
U.S. Cl. 17—46 **20 Claims**



13. A method of removing cheek meat from the skull of an animal, comprising the steps of,

holding the skull at a given orientation along a longitudinal axis,

moving a hook that is located transversely of the longitudinal axis and spaced from the cheek meat toward the skull to a position where said hook is in contact with the cheek meat, and

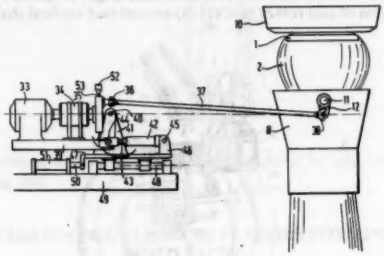
producing relative movement between the hook and the skull in a direction which extends generally lengthwise of the skull to strip the cheek meat from the skull.

4,543,690

APPARATUS FOR FORMING FIBER FELTS

Michel Potters, Pays Bas, France, assignor to Isover Saint-Gobain, Courbevoie, France

Filed Apr. 18, 1984, Ser. No. 601,482
Claims priority, application France, Apr. 20, 1983, 8306431
Int. Cl.[4] D01G *25/00*
U.S. Cl. 19—300 **3 Claims**



1. An apparatus for the formation of a fiber felt, comprising:

means for generating a gas current in which fibers are entrained, said gas current being directed into a receiving enclosure comprised of a perforated conveyor which retains said fibers but allows said gas to pass therethrough,

a mobile guide duct through which said gas current passes prior to said receiving enclosure, which guide duct may be caused to oscillate, in a movement which may be modified in frequency, amplitude and median direction during operation of the apparatus,

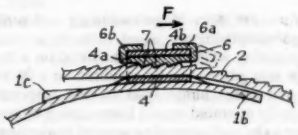
means for inducing and modifying said oscillation, said means further comprising a connecting rod fixed to and connecting said guide duct with an element exhibiting a rotary movement, the connection to said guide duct being effected by a universal joint to a cardan rigidly affixed to said guide duct, the connection to said element exhibiting rotary movement also being effected through a universal joint to a cardan in such fashion that the cardan is entrained in said rotary motion, said oscillation movement and modification being effected by moving the axis of said rotary movement away from or toward the center of the joint of said connecting rod with said guide duct, wherein said element exhibiting rotary movement, and a motor for inducing said movement are supported on a platform which is adapted for rotary movement about an axis and also longitudinal movement relative to said guide duct, said platform being connected to hydraulic jack means capable of displacing said platform.

4,543,691

HOSE CLAMP

Lionel Calmettes, Ozoir-la-Ferriere, France, assignor to Etablissements Caillau, Boulogne-Billancourt, France

Filed Dec. 22, 1983, Ser. No. 564,201
Claims priority, application France, Jan. 13, 1983, 83 00441
Int. Cl.[4] B65D *63/06*
U.S. Cl. 24—20 R **3 Claims**



1. A clamp comprising a wound-over metal band, a first end of which is provided on its external face with an oblong patch of transversely extending scores or teeth, the width of said

patch being preferably less than that of the band, and the second end of which is provided with a fastener joined to the band and wound over crosswise thereof on the outside of the band to provide a passage for the first end, the two ends of the fastener covering one another on the outside of the band and being assembled by a bent strip of metal of which the side facing the band is provided with scores or the like, extending crosswise to the band, and designed to cooperate with the scores or teeth of the first end of the band for tightening said clamp.

4,543,692

CLASP FOR ORNAMENTS

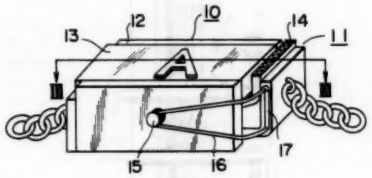
Sadao Ode; Toshikazu Hatsuse, both of Tokyo, and Hiroshi Shiina, Saitama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,733

Claims priority, application Japan, Dec. 28, 1982, 57-198881[U]

Int. Cl.⁴ A44B *19/00*

U.S. Cl. 24—616 **3 Claims**



1. A clasp for an ornament such as a necklace, pendant, bracelet and watch band comprising: a clasp body connected to one end of said ornament; and an engaging member connected to the other end of the same and having a slot therein, said engaging member being adapted to be lockingly secured in said clasp body, said clasp body including a housing having grooves, and a cover having, on its surface, an ornamental portion such as a letter and pattern, and on its sides, projecting pieces for engaging the grooves in said housing, and a lug for engaging the slot in said engaging member, said cover being replaceably formed.

4,543,693

SAFETY BELT BUCKLES

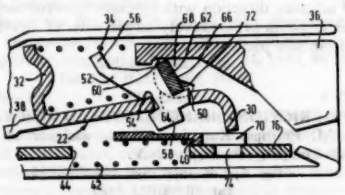
Douglas J. Cunningham, Lutterworth, England, assignor to Britax (Wingard) Limited, England

Filed Jun. 21, 1983, Ser. No. 506,438

Claims priority, application United Kingdom, Jul. 2, 1982, 8219285

Int. Cl.⁴ A44B *11/26*

U.S. Cl. 24—640 **17 Claims**



1. A tongue and buckle fastener for a safety belt comprising a tongue having a latching formation thereon, and a buckle comprising a body in which a pssageway is provided for receiving the tongue, a spring-loaded tongue ejector slidable in the passageway, a latch member movable transversely of the passageway between a latching position in which it engages with the latching formation to retain the tongue in the passageway, and a released position in which the tongue is displaceable by the ejector outwardly from the passageway from its retained position, an abutment on the body located on the opposite side of the latch to the passageway, spring means for biasing the latch member into its released position, a first strut located between the latch member and the abutment and engaging with a fulcrum on the latch member for pivotal movement about said fulcrum, a second strut engaging between the first strut and the abutment, stop means on the body for limiting the struts to movement between a first stable position in which the struts hold the latch member in its latching position against the action of its biasing spring, and a second stable position in which the latch member is free to move into its released position, locking means comprising a projecting on the first strut extending into the passageway so as to initiate movement of the struts to their first position when the tongue is inserted into the passageway, and manually operable release means arranged to engage with the first strut to initiate movement of the struts into their second position, the first and second struts being so shaped and the stop means being so positioned relative to the abutment that the distance between the fulcrum and the abutment initially increases as the struts move from each of their stable positions towards the other stable position and is at a maximum when the struts are in a first intermediate position when moving from the first stable position to the second stable position and in a second intermediate position when the struts are moving from the second stable position to the first stable position, the first intermediate position being between the second intermediate position and the first stable position.

4,543,694

LOCK FOR SAFETY BELTS

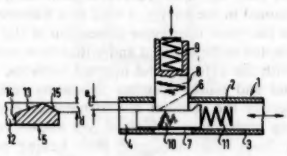
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,773

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243655

Int. Cl.⁴ A44B *19/00*

U.S. Cl. 24—656 **3 Claims**



1. Lock for a safety belt comprising:
a lock housing with an insertion path;
an insertion tab for insertion into the insertion path of the lock housing;
a latch in the housing, which is movable transversely to the insertion path;
an ejector element movable along the insertion path to eject said insertion tab;
and a manually pressure member movable to initiate shifting of said latch from a closed position engaging said insertion tab into an open position for disengagement of said latch from said insertion tab;
said latch being spring biased into its closed position;
said ejection element being spring biased into an ejection position corresponding to the ejection of said insertion tab;
said insertion tab having a front edge for abutment against the ejection element, a run-up bevel for cooperation with

said latch when said insertion tab is ejected from said insertion path, and an abutment edge adjacent to said run-up bevel for cooperation with said latch when said latch is in its closed position to block said insertion tab in said lock, housing;

said latch being held in its open position by abutment against said ejection element after said ejection element has ejected said insertion tab;

said ejection element, upon insertion of said insertion tab along said insertion path, being pushed by said front edge of said insertion tab into a position disengaging said latch to permit said latch to engage said abutment edge of said insertion tab when it is fully inserted into said lock housing;

and said manual pressure member, upon manual actuation thereof, pushing said latch sufficiently to disengage said abutment edge from said latch, said latch being further urged into its open position by cooperation with said run-up bevel by the action of said ejection element pushing said insertion tab out of said insertion path.

4,543,695

JEWELRY CLUTCH

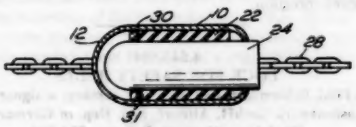
Edmund Dorsey, 455 Meschanticut Valley Pkwy., Cranston, R.I. 02920

Continuation-in-part of Ser. No. 327,887, Dec. 7, 1981, Pat. No. 4,404,713. This application Jun. 30, 1983, Ser. No. 509,340

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.[4] A44B *17/00*

U.S. Cl. 24—662 **3 Claims**



1. A clutch comprising a tubular shell closed at one end to define an open cavity, a resilient stretchable tubular clutch member having a through bore and an outer transverse dimension smaller than the inner transverse dimension of the cavity loosely retained in the cavity, a stud of a tranverse dimension larger than the inner transverse dimension of the clutch member and adapted to be inserted and withdrawn from the clutch member with the external and internal surfaces, respectively, of said stud and clutch member in sealing relation to each other, whereby the resilient clutch member expands in said shell during insertion of said stud, yet allows release of displaced air from said shell, said shell having peripheral lip means at the open end of the cavity and being imperforate except for said open end, means at the inner end of the cavity providing a passageway for air from the bore of the tubular clutch member to the wall of said shell, whereby, as the stud is withdrawn, the clutch member seals against the lip means and a partial vacuum occurs thereby resisting disengagement.

4,543,696

DEVICE FOR SEPARATING AND DELIVERING INDIVIDUAL HEDDLES OR DROP WIRES TO A DRAW-IN POSITION

Heinz John, deceased, late of Berneck, and by Friedlinde John née Rueffler, Heir, Gams, both of Switzerland, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

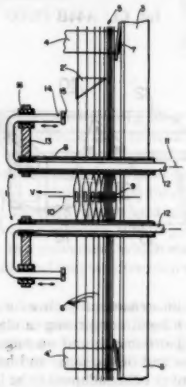
Filed Sep. 30, 1982, Ser. No. 430,286

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139626

Int. Cl.[4] D03J *1/14*

U.S. Cl. 28—206 **4 Claims**

1. In an apparatus for picking up individual heddles (6) from a pack (5) of heddles having a long axis, a width, and a thickness and for delivering an individual heddle in an advance direction (V) to a draw-in zone for threading, including means for individually separating said heddles from said pack of heddles and for individually delivering each separated heddle to said draw-in zone, comprising guide means including upper and lower guide rails (4, 4') for holding said heddles so that said width of said heddles extends substantially perpendicularly to said advance direction, said guide rails preventing rotation of said heddles about said long axis, said guide rails defining a feed advance plane extending substantially vertically between said upper and lower guide rails (4, 4') and in said advance direction (V), said means for separating including at least two stationary magnetic plates (2, 2') forming a pair, means (17, 17') operatively mounting one of said magnetic plates on one side of said pack of heddles and the other magnetic plate opposite said one magnetic plate on the other side of said pack of heddles so that both magnetic plates extend in parallel to each



other and on opposite sides of said feed advance plane to form a gap of constant width, each magnetic plate having a heddle thickness facing surface in parallel to said feed advance plane, said facing surfaces extending in parallel to each other, both facing surfaces having the same magnetic polarization so that the respective magnetic forces oppose each other across said feed advance plane, and so that said magnetic forces extend substantially perpendicularly to said length axis, each of said heddles having at least one magnetically responsive portion located for cooperation with said pair of magnetic plates, each of said magnetic plates having a shape which widens in said advance direction (V) and in parallel to said feed advance plane for providing a magnetic field strength which increases in said advance direction, whereby said magnetic plates cause said heddles to individually separate from said pack of heddles in said advance direction with spacings between neighboring heddles growing progressively larger with an increasing distance from said pack of heddles.

4,543,697

LOW FRICTION DRAFTING SYSTEM FOR YARNS

Bobby M. Phillips, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,882

Int. Cl.[4] D02J *1/22*

U.S. Cl. 28—246 **4 Claims**

1. A low friction drafting system for yarn and comprising:

a driven feed means for feeding said yarn at a predetermined speed;

a driven output means for forwarding said yarn at a predetermined speed greater than that of said driven feed means;

a first low friction freely rotatable hot roll, the surface of which is heated to a predetermined temperature for preheating said yarn; said first freely rotatable hot roll being located between said driven feed means and said driven output means;

a low friction separator roll spaced adjacent to said first freely rotatable hot roll and wherein said yarn is wrapped a plurality of times around said first freely rotatable hot roll and said separator roll;

a second low friction freely rotatable hot roll, the surface of which is heated to a predetermined temperature greater than that of said first freely rotatable hot roll for thermally stabilizing the yarn; said second freely rotatable roll being located between said first freely rotatable hot roll and said driven output means;

a low friction second separator roll spaced adjacent to said

second freely rotatable hot roll and wherein said yarn is wrapped a plurality of times around said second freely rotatable hot roll and said second separator roll;

said driven feed means and said first freely rotatable hot roll operating at essentially the same surface speed with said first freely rotatable hot roll being driven by engagement with the yarn, and said second freely rotatable hot roll and said driven output means operating at essentially the same surface speed but greater than that of said first freely rotatable hot roll with said second freely rotatable hot roll being driven by engagement with the yarn; and

whereby sufficient yarn tension automatically is transferred upstream of said first freely rotatable hot roll to pretension said yarn before it contacts said first freely rotatable hot roll and drafting of said yarn takes place between said first freely rotatable hot roll and said second freely rotatable hot roll.

4,543,698

SETTING FOR A PRECIOUS STONE AND A METHOD OF MOUNTING THE STONE IN THE SETTING

Alain Plantureux, Montpellier, France, assignor to Jean-Louis Chancel, Geneva, Switzerland

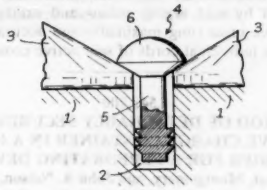
Continuation of Ser. No. 282,771, Jul. 13, 1981, abandoned. This application Nov. 9, 1983, Ser. No. 550,502

Claims priority, application France, Jul. 14, 1980, 80 75569

Int. Cl.[4] B23P *5/00, 19/02*

U.S. Cl. 29—10 **8 Claims**

1. The method of setting precious stones which have an inclined bevel peripherally thereof in a mounting of precious metal of 50 to 60 vickers, comprising forming at least one seat on the mounting for receiving the base of the stone, forming at least two smooth bore holes in the mounting at diametrically-opposite sides of the seat of 0.43 millimeters diameter, the axes of which are perpendicular to the seat, providing two fastening elements of precious metal of 130 to 140 vickers, each comprising a head of larger diameter than the hole and a stem of smaller diameter than the hole, wherein the head has a frustoconical underside and a convex upper side and wherein the inclination of the frustoconical side corresponds to the inclination of the bevel at the periphery of the stone, and wherein the stem is provided adjacent its distal end with an excrescence peripherally thereof of triangular vertical section 0.02 millimeters larger in diameter than the hole, defining a sharp peripheral edge, said excrescence being defined by a flat radial surface at right angles to the axis of the hole, and a flat surface inclined thereto, wherein said flat radial surface precedes the



flat inclined surface in the direction of the distal end of the stem, and forcing said fastening elements into the holes at the diametrically-opposed sides of the stone to a position such that the undersides of the heads of the fastening elements have clamping engagement with the bevel peripherally of the stone and the excrescences are wedged into the holes and frictionally engaged with the sides thereof.

4,543,699

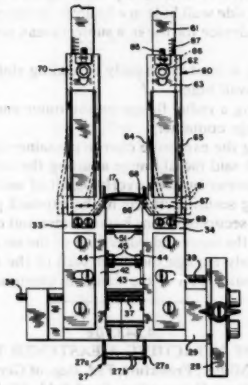
APPARATUS FOR ASSEMBLING SLATTED VENETIAN BLINDS

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Industries B.V., Rotterdam, Netherlands

Filed Nov. 14, 1983, Ser. No. 551,200

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—24.5 **17 Claims**



1. In a unit for positioning and guiding slat material for a venetian blind between individual cords of an active cross-rung extending between two side cords of a venetian blind ladder cord or the like, said unit comprising:

a body portion;

means secured to said body portion for resiliently urging a non-active cross-rung in a direction opposite to the direction of ladder cord advance, said non-active cross-rung being positioned, with respect to the direction of said advance, upstream of said active cross-rung, and

means for guiding said slat material for insertion between and through the individual cords of the active cross-rung to form an interlaced slat,

wherein the improvement comprises:

means on said body portion capable of and positioned close

to the plane through which said ladder cord advances to abuttingly engage with the bottom surface of a slat readily interlaced in the cross-rung directly preceeding said active cross-rung for suporting this slat downstream of said active cross-rung with respect to the direction of said advance, thereby holding the active cross-rung in a substantially fixed predetermined position between said urging means and said supporting means such that a force provided by said urging means and exerted onto said non-active cross-rung maximally and accurately spreads apart the individual cords of said active cross-rung.

4,543,700

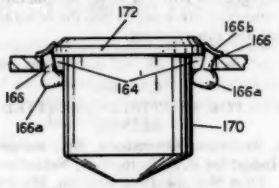
METHOD OF DETACHABLY SECURING AN EXPLOSIVE CHARGE CONTAINER IN A HOLLOW CARRIER FOR A PERFORATING DEVICE

Gregg W. Stout, Montgomery, and John A. Nelson, Spring, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Division of Ser. No. 432,481, Oct. 4, 1982, Pat. No. 4,479,556. This application Apr. 13, 1984, Ser. No. 599,791

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—426.4 **5 Claims**



1. The method of detachably securing an explosive charge container in a side wall hole in a hollow carrier received within a perforating device for use in a subterranean well, comprising the steps of:

(1) forming at least one axially extending slot in the wall of the side wall hole;

(2) providing a radial flange on the outer end of the explosive charge container;

(3) inserting the explosive charge container in the side wall hole with said radial flange abutting the outer face of the hollow carrier but not overlying all of said slot;

(4) inserting securing means in the exposed portion of said slot, said securing means having inner and outer ends; and

(5) moving the inner and outer ends of the securing means to respectively engage the inner wall of the hollow carrier and the outer wall of the flange in clamping relation.

4,543,701

METHOD OF ATTACHING A FASTENER TO A PANEL

Rudolf R. M. Müller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Southfield, Mich.

Continuation of Ser. No. 229,274, Jan. 29, 1981, abandoned. This application Jun. 14, 1983, Ser. No. 504,074

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003908

Int. Cl.[4] B23P *11/00*

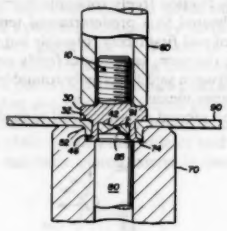
U.S. Cl. 29—432.1 **17 Claims**

1. A method of attaching a metal fastener to a generally planar metal panel, said metal fastener having an enlarged fastener head portion and a self-piercing riveting end portion, said self-piercing riveting end portion including a central recess enclosed by a self-riveting wall on opposed sides of said recess, the distal end of said wall having a internal piercing edge adjacent said recess, said recess termination in a bottom wall, the method comprising the following steps:

(a) locating said fastener adjacent a panel with said self-riveting wall distal end facing said panel and a die member located on the opposite side of said panel aligned with said fastener,

(b) forcing said fastener toward said die member by engaging said enlarged portion, said wall piercing edge piercing a slug from said panel into said central recess, and

(c) simultaneously plastically deforming said self-riveting wall distal end outwardly relative to said central recess, plastically deforming said panel slug against said bottom



wall, thereby compressing said panel slug outwardly against the internal surface of said opposed sides of said wall, and plastically deforming the pierced edge of said panel from the plane of said panel toward said deformed wall distal end against the external surface of said self-riveting wall, and locking said deformed pierced panel edge between said fastener enlarged head portion and said outwardly deformed self-riveting wall distal end.

4,543,702

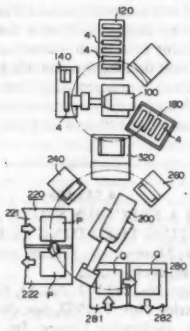
FULLY AUTOMATIC METHOD AND APPARATUS FOR ASSEMBLING STICK-TYPE COSMETICS

Katsuhiko Wada, Amagasaki, Japan, assignor to Satoh Seiki Co., Ltd. and Elsol Product Corp., both of, Japan

Filed May 14, 1984, Ser. No. 609,724

Int. Cl.[4] B23P *11/00, 21/00*

U.S. Cl. 29—434 **6 Claims**



1. Fully automatic method for assembling stick-type cosmetics using first and second robots comprising the steps of

placing a mould in position at first operational station with its stick holes open upwards,

taking out said mould from said first operational station by operation of said first robot for transfer to a second operational station,

charging material paste in said stick holes of said mould at said second operation station,

taking out a charged mould from said second operational station by operation of said first robot for transfer to a third operational station whereat said charged mould is cooled,

taking out a cooled mould from said third operational station by operation of said first robot for transfer to a fourth operational station,

exposing tails of sticks out of the top face of said mould at said fourth operational station,

placing, concurrently with the above-described operations of the first robot, a group of bottles upside down in position at a fifth operational station, the number of said bottles in said group being equal to that of said stick holes in said mould,

taking out said group of bottles from said fifth operational station by operation of said second robot for transfer to a sixth operational station while keeping upside down position of said bottles,

causing relative rotation between the main case and the rotary body of each said bottle for projection of the stick holder at said sixth operational station,

taking out said group bottles upside down from said sixth operational station by operation of said second robot for transfer to said fourth operational station,

combining said bottles with said tails of said sticks by operation of said second robot at said fourth operational station,

separating stick-bottle combinations from said mould by operation of said second robot at said fourth operational station,

taking out said mould separated from said stick-bottle combinations from said fourth operational station by operation of said first robot for transfer to said second operational station,

taking out a charged mould from said second operational station by said first robot for transfer to said third operational station,

taking out, concurrently with the above-described operations of the first robot, said stick-bottle combinations from said fourth operational station by operation of said second robot for transfer to a seventh operational station,

causing relative rotation between the main case and the rotary body of said bottle in each said stick-bottle combination for withdrawl of the stick at said seventh operational station,

taking out said stick-bottle combinations from said seventh operational station by operation of said second robot for transfer to an eighth operational station, and

combining said stick-bottle combinations with caps placed upside down in positions at said eighth operational station by operation of said second robot.

3. Fully automatic apparatus for assembling stick-type cosmetics comprising

a first robot provided with a main body rotatable in a horizontal direction, an extensible arm projecting forwards from said main body, a head secured to the tip of said arm, and at least one pair of fingers which are vertically movably coupled to said head and adapted for clamping a mould for shaping sticks,

a mould supply unit arranged within the operational ambit of said first robot,

a material charge unit arranged within said operational ambit of said first robot and provided with at least one material paste nozzle,

a cooling unit arranged within said operational ambit of said first robot,

a second robot provided with a main body rotatable in a horizontal direction, an extensible arm projecting forwards from said main body, a head main body coupled to the tip of said arm in a horizontally rotatable arrangement, a pair of finger plates which are vertically movablly coupled to said head main body and adapted for clamping prescribed number of bottles, and holding nozzles vertically movably coupled to said head main body in communication with a pneumatic suction source and adapted for holding same number of bottles,

a bottle supply unit arranged within the operational ambit of said second robot,

a bottle draw-out unit arranged within said operational ambit of said second robot and provided with means for causing relative rotation between the main case and the rotary body of each said bottle,

a stick draw-in unit arranged within said operational ambit of said second robot and provided with means for causing relative rotation between the main case and the rotary body of each said bottle, and

a docking unit arranged within said operational ambits of said first and second robots and provided with means for exposing tails of sticks out of said mould.

4,543,703

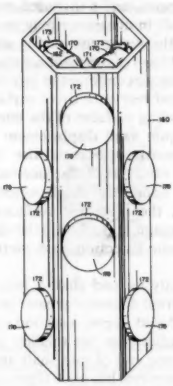
METHOD OF FIELD ASSEMBLY OF A SELECTED NUMBER OF SHAPED CHARGES IN A WELL CASING PERFORATING GUN

Rodney J. Wetzel, Woodlands, and Gregg W. Stout, Montgomery, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Continuation-in-part of Ser. No. 250,772, Apr. 3, 1981, abandoned. This application Apr. 7, 1982, Ser. No. 366,267

Int. Cl.[4] B21D *39/00*

U.S. Cl. 29—455 R **2 Claims**



1. The method of field assembly of a selected number of shaped charges in a well casing perforating gun, comprising the steps of:

(1) selecting an extruded polygonal carrier strip having N faces where N is an even number greater than 4 and N/2 equals the desired number of perforations at any horizontal level;

(2) forming shaped charge container mounting holes in vertically spaced relation in each planar side of the polygonal carrier with each horizontally aligned group of mounting holes being angularly spaced from the vertically adjacent horizontal group of mounting holes by 360°/N;

(3) inserting shaped charge containers in the mounting holes;

(4) inserting the polygonal carrier and shaped charge containers in a tubular housing connectable to a work string.

4,543,704

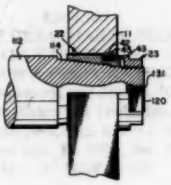
METHOD FOR ANCHORING A MACHINE ELEMENT COAXIALLY ON A ROTARY SHAFT

Dimitri G. Soussloff, Wyomissing, Pa., assignor to Fenner America Inc., Manheim, Pa.

Continuation of Ser. No. 332,966, Jul. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 179,286, Mar. 10, 1980, Pat. No. 4,345,851, which is a continuation-in-part of Ser. No. 923,056, Jul. 10, 1978, Pat. No. 4,202,644. This application Mar. 30, 1984, Ser. No. 594,950

Int. Cl.[4] B23P *25/00*

U.S. Cl. 29—458 4 Claims



1. A method for mounting a machine element having a cylindrical bore at a desired axial position coaxially on a shaft using a device comprising a segmented sleeve adapted to encircle said shaft, said sleeve having a tapered internal surface, a straight cylindrical outer surface corresponding in diameter to the cylindrical bore of said machine element and outwardly-directed circumferential interlock means adjacent said outer cylindrical surface providing opposed forward and rearward radial drive surfaces substantially perpendicular to the central axis of said shaft, said interlock means having outer cylindrical surfaces with diameters less than the diameter of said cylindrical bore, said segmented sleeve comprising a plurality of separate separable segments, and a threaded clamping nut adapted to encircle said shaft in circumscribing engagement with said interlock means of the sleeve and having an outer diameter less than the cylindrical bore of the machine element and inwardly-directed cooperating circumferential interlock means defining opposed forward and rearward drive surfaces adapted to confront the corresponding surfaces of the interlock means of said sleeve, whereby upon axial displacement of said nut in one direction, the forward surfaces of the respective interlock means engage and effect axial displacement of said sleeve in one direction, and upon axial displacement of said nut in the opposite direction, the rearward surfaces of the respective interlock means engage and effect axial displacement of said sleeve in the opposite direction, said method comprising the steps of

providing coaxially on said shaft a first cylindrical surface having an external diameter greater than the largest internal diameter of said sleeve, a second cylindrical surface of a diameter smaller than the smallest internal diameter of said sleeve at one end of said shaft and a tapered surface between said portions having a taper corresponding to the tapered internal surface of said sleeve,

providing a threaded portion on said second cylindrical surface of said shaft, said threaded portion adapted to threadedly engage the threaded portion of the nut so that rotation of said nut on said shaft effects said axial displacement of said nut in opposite directions,

interlocking said clamping nut with said segmented sleeve so that the drive surfaces of the nut confront the corresponding drive surfaces of the sleeve,

engaging said sleeve on tapered surface provided on said shaft while interlocked with said nut and threading the clamping nut on the threaded portion provided on said shaft,

passing the machine element over the nut and registering the cylindrical bore of said machine element in circumscribing relation to the cylindrical outer surface of said sleeve at the desired position, and

tightening said nut to drive said sleeve up the tapered surface of said shaft, and effective expansion of said sleeve within said bore to firmly anchor said machine element on said shaft, the relative dimensions of said shaft, said sleeve and said nut restricting displacement of said sleeve to maintain surface-to-surface engagement between said tapered surfaces along their axial extent.

4,543,705

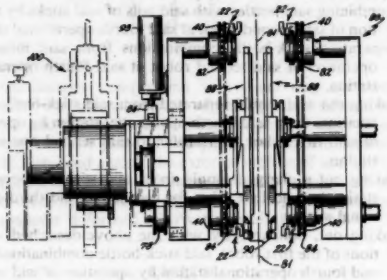
AXIAL-LEAD COMPONENT SEQUENCING AND INSERTING APPARATUS

Richard Porterfield, Chenango Bridge, N.Y.; Henry J. Soth, Brackney, and Douglas A. Biesecker, Clark Summit, both of Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,650

Int. Cl.[4] H05K *13/04*

U.S. Cl. 29—566.3 30 Claims



1. In an apparatus for automated processing of axial lead components, each having a body and at least two leads extending generally coaxially in opposite directions from said body, said processing comprising inserting leads of said components into corresponding holes of a circuit board at an insert station, said apparatus having means for conveying a series of said components incrementally along a conveying path to said insert station, means for forming said leads preparatory to said inserting, and means for performing said lead inserting, the improvement comprising:

means for shifting at least a portion of said conveying means in a reverse direction sufficiently for said forming means not to engage components carried on said conveying means during moving of said forming means from said path at a forming station, and for shifting at least said conveying means portion in a forward direction sufficiently for at least one of a series of spaced component positions of said conveying means to bypass said forming station prior to moving said forming means back into said path while not engaging said components; and

means for moving said forming means from and into said path according to a controller.

4,543,706

FABRICATION OF JUNCTION FIELD EFFECT TRANSISTOR WITH FILLED GROOVES

Izak Bencuya, Needham, and Adrian I. Cogan, Waltham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 24, 1984, Ser. No. 583,514

Int. Cl.[4] H01L *21/223, 21/31*

U.S. Cl. 29—571 16 Claims

1. The method of fabricating a junction field effect transistor comprising

providing a body of semiconductor material including a first layer of semiconductor material of one conductivity type of relatively low resistivity, a second layer of semiconduc-

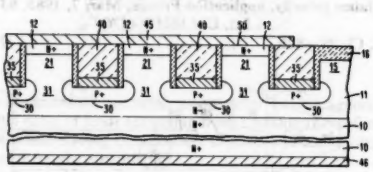
tor material of said one conductivity type of relatively high resistivity contiguous said first layer, and a third layer of semiconductor material of said one conductivity type of relatively low resistivity contiguous said second layer, said first layer having a surface at a surface of the body;

forming a layer of a first protective material adherent to said surface;

forming a plurality of parallel grooves through said layer of first protective material and into said body of semiconductor material providing interposed ridges of semiconductor material, said grooves extending through said first layer of semiconductor material into said second layer of semiconductor material, each of said grooves having side walls formed by the adjacent ridges of semiconductor material and an end wall;

treating the body of semiconductor material to convert semiconductor material except at the surfaces of the ridges of semiconductor material protected by said first protective material to a second protective material thereby forming a layer of said second protective material at the side walls and end walls of said grooves;

removing the layer of said second protective material from the end walls of said grooves to expose said second layer of semiconductor material;



introducing conductivity type imparting material of the opposite conductivity type into said second layer of semiconductor material at the end walls of said grooves, said conductivity type imparting material of the opposite conductivity type extending laterally to convert zones of said second layer of semiconductor material to said opposite conductivity type and to produce channel regions of the one conductivity type of relatively high resistivity between said converted zones, the width of said channel regions being less than the width of the semiconductor material of said ridges of semiconductor material;

applying conductive material to said end walls to form first electrical connections in ohmic contact with said zones of the opposite conductivity type;

applying filler material to fill said grooves and to extend beyond the surface of said ridges of semiconductor material to provide a surface parallel to the original surface of the body;

removing material from said surface of the filler material to a depth to expose semiconductor material of the one conductivity type of said first layer in said ridges of semiconductor material; and

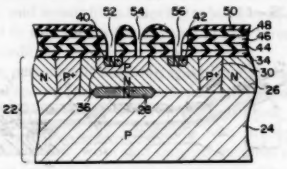
applying conductive material to form a second electrical connection in ohmic contact with the semiconductor material of the one conductivity type of said first layer in said ridges of semiconductor material.

4,543,707

METHOD OF FORMING THROUGH HOLES BY DIFFERENTIAL ETCHING OF STACKED SILICON OXYNITRIDE LAYERS

Toshiyo Ito, Yokohama, and Jiro Ohshima, Kawasaki, both of Japan, assignors to Kabushiki Kaisha, Japan

Filed Jun. 29, 1984, Ser. No. 626,386
Claims priority, application Japan, Jun. 30, 1983, 58-117083
Int. Cl.[4] H07L *21/90*; B44C *1/22*
U.S. Cl. 29—578 **3 Claims**



1. A process of producing a semiconductor device comprising the steps of:

stacking at least two silicon oxynitride layers of which nitrogen to oxygen ratio differs from each other on a semiconductor substrate, in which the etching rate of the top layer is faster than that of the second layer from the top; and

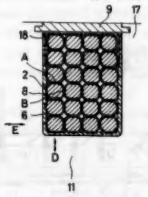
selectively etching the stacked silicon oxynitride layers to form a through hole in the same, thereby providing a through hole with an obtuse opening edge.

4,543,708

METHOD OF MANUFACTURING AN ARMATURE

Kazunori Matsubara, Sakura; Masanori Yoshizaki, Yachiyo; Takao Mifune, Ichikawa; Kenichi Nakamura, Yachiyo; Yukio Endo; Hidetoshi Takamatsu, both of Funabashi; Yutaka Saito, and Takeshi Kawana, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,866
Claims priority, application Japan, Dec. 27, 1982, 57-226842
Int. Cl.[4] H02K *15/06*
U.S. Cl. 29—598 **6 Claims**



1. A method of manufacturing an armature of a rotary electric machine comprising, placing a cushioning member in an open slot formed in a core, disposing weirs at the ends of teeth located on both sides of said open slot, disposing a side of a coil in said open slot and between said weirs, said coil being made of a conductor which has an insulation film of a synthetic resin and, which is wound through said slot so as to form a plurality of rows of conductor windings with the rows extending in a direction from the bottom of the slot toward the opening thereof, and pressing said side of the coil from the opening of said open slot toward the bottom thereof in order to deform the cross-sectional shape of the conductor windings thereof from a circular shape into a non-circular shape so that the deformation of the cross-sectional shape of the coil winding is greater in the direction of said rows than in the direction at right angles thereto.

4,543,709

Patent Not Issued For This Number

4,543,710

METHOD OF REDUCING CORONA DISCHARGE IN AN ELECTROSTATIC SPRAY GUN

Donald R. Hastings, Elyria; Glen A. Herstek, Lorain, and Don R. Scarbrough, Elyria, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 5, 1983, Ser. No. 539,087

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] H01C *17/02*

U.S. Cl. 29—613 **10 Claims**

1. A method of preventing corona discharge in the area of a high-value resistor of an electrostatic spray gun, comprising the steps of:

inserting an insulating tube within a bore formed in the spray gun;

positioning a resistor within said insulating tube;

filling at least a portion of said insulating tube with a quantity of flowable, dielectric material;

inserting a high voltage cable into said insulating tube so as to force said dielectric material ahead of said cable, said resistor being encapsulated with said dielectric material.

4,543,711

SYSTEM FOR AUTOMATICALLY INSERTING U-TUBES OF HEAT EXCHANGER OR THE LIKE

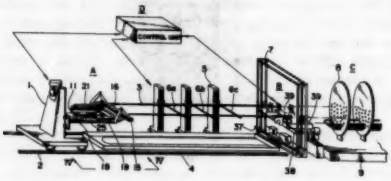
Takeshi Wada; Hisanao Kita; Tatsuji Wada; Susumu Fujishima, all of Hitachi, and Hironori Kadowaki, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,409

Claims priority, application Japan, May 20, 1983, 58-87749

Int. Cl.[4] B23P *15/26*

U.S. Cl. 29—726 **7 Claims**



1. A system for automatically and successively inserting a plurality of U-shaped heat transfer tubes into supporting members of an equipment such as a heat exchanger, said system comprising:

fixing means for removably fixing said support members at a predetermined pitch, each of said support members having a plurality of holes for receiving said heat transfer tubes, such that two holes in each support member for receiving both straight portions of an identical heat transfer tube are located at a substantially equal level and corresponding holes in said support members are axially aligned;

gripping means for gripping a heat transfer tube and raising the same to the level of the holes into which said heat transfer tube is to be inserted, said gripping means being movable relatively to said support members so as to be able to press the gripped heat transfer tube in the direction of alignment of said holes;

positioning means disposed between said gripping means and the support members fixed by said fixing means, said positioning means being adapted to clamp said heat transfer tube on said gripping means from the upper and lower sides and to clamp the straight portions of said heat transfer tube from both lateral sides to bring said heat transfer tube into alignment with the holes which are to receive said heat transfer tube while keeping said heat transfer tube in a horizontal posture; and

control means operatively connected to said gripping means and said positioning means so as to sequentially control the operation of both means in accordance with a previously set order of insertion of said heat transfer tubes and the widths of said heat transfer tubes, the sequence being such that after said heat transfer tube is raised by said gripping means, said gripping means moves towards said support members while allowing said positioning means to clamp said heat transfer tube, as said heat transfer tube is inserted deeper into said support members, said heat transfer tube is released from the clamping by said positioning means and, after the completion of insertion of said heat transfer tube, said gripping means releases said heat transfer tube and is returned to a position for gripping the next heat transfer tube.

4,543,712

PROCESS FOR ASSEMBLING A CLAD BUSBAR OF AN ELECTRICAL INSTALLATION

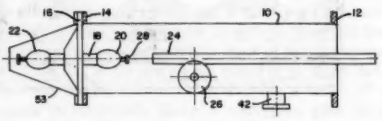
Georges Henry, St. Martin le Vinoux, and Jean Kieffer, Brignoud, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Feb. 28, 1984, Ser. No. 584,449

Claims priority, application France, Mar. 7, 1983, 83 03810

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—825 **7 Claims**



1. A busbar assembly process for a high voltage metal clad electrical installation having sub-divided modular sections, each modular section having a tubular metal cladding enclosure fitted with fixing flanges at the ends, a conductor bar coaxially fitted inside the enclosure, and a support insulator fixed to one of said flanges and supporting said bar at one of its ends, said method comprising the steps of:

pre-assembling each section at an off-site location by inserting the bar into the enclosure, the bar being supported by a carriage; fixing one end of the bar to the support insulator fastened to one of the ends of the enclosure; temporarily supporting the opposite overhanging end of the bar by a temporary supporting tool; withdrawing the carriage from a free end of the enclosure; and fitting the overhanging end of the bar on a removable support which bears on the enclosure; and

shipping the assembly to an on-site location and withdrawing the removable support from the enclosure before connecting the section to an adjacent section.

4,543,713

TECHNIQUE FOR INSERTING CONNECTOR LEADS INTO A CIRCUIT BOARD

Willard E. Rapp, Franklin Township, Somerset County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Aug. 8, 1983, Ser. No. 521,514

Int. Cl.[4] H05K *3/30;* **B23P** *19/00*

U.S. Cl. 29—837 **8 Claims**

1. A method of mounting a connector, having a plurality of

parallel rows of leads extending from one side thereof, onto a circuit board having components thereon and a plurality of parallel rows of vias therethrough, the method comprising the steps of:

placing the circuit board on a support member;

positioning a comb, having parallel rows of slots therein corresponding to the spatial orientation of the parallel rows of vias, proximate the components and spaced from the circuit board with the slots aligned with the respective vias;

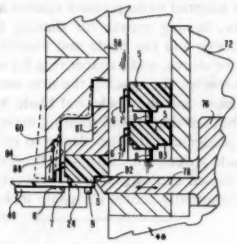
urging the connector towards the comb, in a direction parallel to the surface of the circuit board, to engage the leads in the respective slots therein;

moving the comb connector in concert towards the circuit board until the comb contacts the board;

applying a force to the connector to urge the leads along the slots into the respective vias;

arcuately moving the comb, through a small angle, towards the components to disengage the leads therefrom; and

moving the comb away from the circuit board in a direction normal to permit removal of the board, with the connector mounted thereon, from the support member.



5. An apparatus for mounting a connector, having a plurality of parallel rows of leads extending from one side thereof, onto a circuit board having components thereon and a plurality of vias therethrough, comprising:

a base;

means, mounted on the base, for supporting the circuit board;

a comb, having individual slots therein corresponding to the spatial orientation of the individual vias;

means, mounted on the base, for arcuately moving the comb to and from a position spaced from the circuit board with the slots aligned with the respective vias;

means, mounted on the base, for urging the connector towards the comb to engage the leads in the respective slots therein;

means, mounted on the base, for moving the comb and connector in concert towards the board until the comb contacts the board; and

means, associated with the moving means, for applying a force to the connector to urge the leads along the slots into the respective vias.

4,543,714

MACHINE INSERTION OF CIRCUIT MODULE TERMINALS

Lewis L. Seffernick, Decatur, and Gary W. Trobridge, Portland, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Sep. 21, 1982, Ser. No. 420,714

Int. Cl.[4] H05K *3/00;* **B23P** *19/00*

U.S. Cl. 29—845 **38 Claims**

33. A terminal insertion apparatus for the automatic insertion of terminals into a substrate having terminal receiving means, which comprises:

(a) guideway means for receiving and conveying a plurality of substrates to the substrate side of said terminal insertion apparatus;

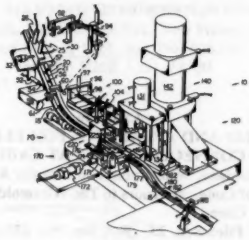
(b) means for supplying a continuous terminal carrier with terminals disposed thereon to the terminal side of said terminal insertion apparatus;

(c) means for periodically advancing said terminal carrier toward the terminal side of said terminal insertion apparatus;

(d) means for periodically advancing said substrates from said guideway means into alignment with a plurality of transmittal barrels located traversely between said substrate side and said terminal side in said terminal insertion apparatus, said means for advancing substrates operatively connected to said means for advancing said terminal carrier to coordinate movement therebetween;

(e) means for periodically securing said terminal carrier with terminals disposed thereon in preparation for separation of a predetermined number of terminals therefrom;

(f) means for periodically separating said predetermined number of terminals from said secured terminal carrier to dispose said separated terminals upon a plurality of longitudinal transmittal slots disposed on said terminal side of



said transmittal barrels on said terminal insertion apparatus, with said separated end of said separated terminals positioned towards said aligned substrate, said means for separating said terminals moves perpendicularly relative to the movement of the terminal carrier to periodically separate said terminals;

(g) means to cover said disposed terminals in said transmittal slots, operative with said separation means;

(h) means to align said covered transmittal slots with the plurality of transmission barrels in said terminal insertion apparatus;

(i) means for periodically supplying a compressed medium to said covered transmittal slots, whereby the separated terminals are forceably propelled by the compressed medium through the transmittal barrels to insert and anchor the separated end of the terminal into the aligned terminal receiving means of the substrate; and

(j) means for removal of said substrate with terminals inserted from said terminal insertion apparatus.

4,543,715

METHOD OF FORMING VERTICAL TRACES ON PRINTED CIRCUIT BOARD

Ralph E. Iadarola, Roseland; Warren F. Strassle, Wayne, and Gene W. Russo, No. Haledon, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 28, 1983, Ser. No. 470,885

Int. Cl.[4] H01K *3/10*

U.S. Cl. 29—852 **14 Claims**

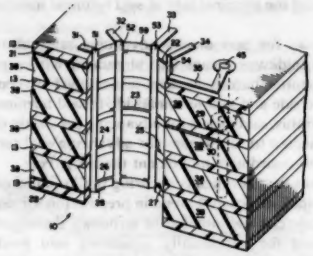
1. Method for forming vertical conductive traces on a multilayer printed circuit board having at least one internal layer characterized by:

forming a plurality of via holes; and

establishing conductive plating paths along the via holes;

boring an opening along said pattern having walls substan-

tially parallel to the via holes, thereby leaving the vertical traces,



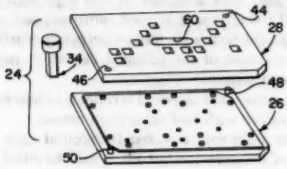
wherein the step of establishing conductive plating paths along the via holes includes electroless plating of the via holes prior to boring the opening.

4,543,716

METHOD AND APPARATUS FOR ELECTRICAL CONNECTION OF FLAT CABLES

Ralph R. Damiano, Naugatuck, and Charles A. Whitney, Canton, both of Conn., assignors to The Wiremold Company, West Hartford, Conn.

Filed Sep. 23, 1983, Ser. No. 535,293
Int. Cl.[4] H01R *43/04;* B23P *19/00*
U.S. Cl. 29—871 **23 Claims**



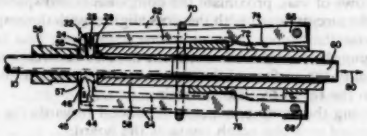
1. For use in splicing or tapping a plurality of electrically conductive connector strips to a pair of flat multiconductor cables arranged in abutting juxtaposed relation to one another, a jig system comprising a base plate having a plurality of cable locating means and guide means thereon, a plurality of cable perforating connector strips fixed on the base plate by the guide means in a predetermined pattern relative to a pair of abutting juxtaposed cables having matching conductor pairs to be connected by the connector strips, and a top plate adapted to be mounted on the base plate in overlying relation to the plurality of connector strips, the top plate having tool apertures therein corresponding to the connector strips and to the matching conductor pairs of the cables to be connected.

20. A method of interconnecting flat multiconductor cables comprising the steps of providing first and second flat multiconductors, locating a plurality of connector strips in parallel relation to one another with the strips each having cable perforating means thereon, locating the first and second cables in juxtaposed relation to one another and in overlying relation to the connector strips with the perforating means of each connector strip aligned in registration respectively with different matching conductor pairs of the respective cables, and applying force to the cables overlying the cable perforating means of the connector strips for piercing the overlying cables and making an electrical connection therebetween.

4,543,717

CABLE STRIPPER

Robert E. Luka, Vancouver, Wash., assignor to Tektronix, Inc., Beaverton, Oreg.

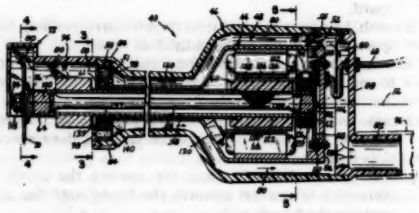
Filed Dec. 16, 1983, Ser. No. 562,377
Int. Cl.[4] H02G *1/12*
U.S. Cl. 30—90.6 **5 Claims**

1. An automatic cable stripper comprising, a tubular sleeve for receiving a cable end, an arm member pivotally mounted on one end thereof to the tubular sleeve, a blade holder on the other end of the arm member, said blade holder having a guide surface, and a blade in said blade holder protruding from said guide surface adapted to be pivoted against a cable within the tubular sleeve, biasing means for biasing the arm member toward the sleeve and the blade and bladed holder against a cable within the sleeve, and a spacer ring for selectively engaging the arm member for spacing the arm member away from the tubular sleeve and the blade and blade holder away from the cable within the sleeve, and rotating means for rotating the blade, blade holder and tubular sleeve to effect relative rotation of the blade around the cable with the guide surface of the blade holder biased against the cable whereby the protruding blade circumferentially scores the cable jacket.

4,543,718

CAST CUTTER APPARATUS

Wayne O. Duescher, St. Paul, Minn., assignor to Twin City Surgical, Inc., St. Paul, Minn.

Filed Feb. 1, 1984, Ser. No. 575,817
Int. Cl.[4] B27B *9/00;* B26B *25/00*
U.S. Cl. 30—124 **17 Claims**



1. A cast cutter, comprising:

(a) a support housing having first and second ends;

(b) an elongated torsion bar, having first and second ends, fixedly interconnected at said first end to said housing so as to prevent oscillatory rotation about a longitudinal axis of said torsion bar at said first end;

(c) a hollow tubular support member, having first and second ends and being inherently more resistant to twisting movement than said torsion bar, fixedly interconnected proximate said second end to said torsion bar proximate said second end of said torsion bar, said hollow tubular support member being concentrically positioned about said torsion bar and extending axially toward said first end of said torsion bar along a portion thereof, said hollow tubular rotor support member being rotatably mounted in said housing by suitable bearing means;

(d) a magnetically interactive rotor fixedly interconnected to the said tubular member at a location axially displaced

from said second end of said first tubular member for oscillatory rotational movement with said tubular member;

(e) a magnetically interactive stator positioned longitudinally adjacent and radially outwardly of said rotor, said stator cooperating with said rotor for inducing oscillatory rotational movement of said hollow tubular member upon interconnection to a suitable power source; and

(f) a cutting blade interconnected to said rotor by said tubular member, said torsion bar cooperating with said hollow tubular member to provide oscillatory rotational movement of said cutting blade.

4,543,719

SHEAR APPARATUS

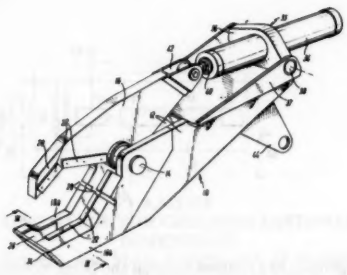
Raymond Pardoe, Bott La., Lye, West Midlands, England

Filed Jun. 16, 1983, Ser. No. 505,015

Claims priority, application United Kingdom, Jun. 19, 1982, 8217842

Int. Cl.⁴ B23P *19/00*

U.S. Cl. 30—134 **3 Claims**



1. A shear attachment adapted for attachment to an arm of an excavating vehicle, said shear attachment comprising:

a. a first member having a first jaw on one end thereof and also fixing means remote from said jaw by which the first member may be mounted on the arm;

b. a second member movably mounted on said first member about a first pivot axis and having a second jaw co-operable with the first jaw of said first member; and

c. a hydraulic piston and cylinder assembly mounted on said first member about a second pivot axis and connected to said member about a third pivot axis and operable to cause relative shearing movement between said first and second jaws, wherein the cylinder of the piston and cylinder assembly is mounted for pivotal movement on the first member at a point between the ends of said cylinder.

4,543,720

CUTTING TOOL

Peter Grunikiewicz, Stuttgart; Karl Gommel, Ditzingen, and Klaus M. Junginger, Heilbronn, all of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Fed. Rep. of Germany

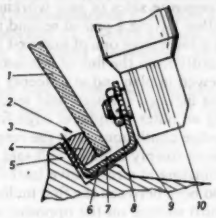
Filed Jul. 13, 1984, Ser. No. 630,517

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 8325025

Int. Cl.⁴ B26B *9/02, 7/00*

U.S. Cl. 30—272 R **10 Claims**

1. Cutting tool for separating beads of adhesive, comprising two flanks connected by a web and forming a U-shaped cross-section, one flank comprising a sickle-shaped blade and the other flank comprising means for attaching the tool to an oscillating driveshaft, wherein the improvement comprises



that the center of curvature of the sickle shape extends toward the point at which the cutting tool is attached.

4,543,721

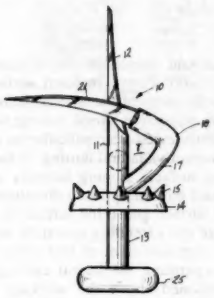
MARTIAL ARTS WEAPON

Kenneth M. Smith, 1-B Malcolm Crt., New Haven, Conn. 06519

Filed May 2, 1984, Ser. No. 606,161

Int. Cl.⁴ B26B *3/04, 11/00*

U.S. Cl. 30—287 **5 Claims**



1. A martial arts weapon comprising a central shaft having a handle portion extending linearly into an elongated sharpened blade, a handguard having an annular periphery intermediate said handle portion and said blade, a member extending from said shaft of the blade side of said shaft beyond said handguard and arcuately turning in a direction substantially perpendicular to said shaft, said arcuately turning member having a blade extending therefrom, a pointed member extending from said central shaft to a dimension beyond the periphery of said handguard, said pointed member being substantially perpendicular to the end of the blade on said arcuately extending member, said pointed member extending from said shaft between said handguard and the sharpened end of said central shaft.

4,543,722

SLUG-SPLITTING PUNCH

Larry G. Adleman, and Richard H. Malanaphy, both of Rockford, Ill., assignors to Ex-Cell-O Corporation, Troy, Mich.

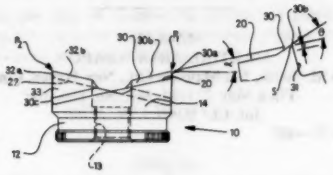
Filed Jan. 27, 1983, Ser. No. 461,406

Int. Cl.⁴ B26F *1/00*

U.S. Cl. 30—360 **17 Claims**

1. A male punch useful with a female die member to remove an annular slug in two pieces from a workpiece, comprising an elongate punch body having an axial bore for alignment with a hole in the workpiece to receive means for moving said punch body inwardly and outwardly with respect to the female die member, said punch body having a working face with a pair of

first inclined surfaces disposed on opposite sides of said bore and sloping upwardly in opposite directions, said first surfaces each having an outer peripheral edge forming a first outer cutting edge on opposite sides of said working face, and said working face further having a pair of second inclined surfaces each intersecting a respective one of said first inclined surfaces and sloping upwardly from the line of intersection toward one another when viewed in plan and at a steeper angle of inclination than said first inclined surfaces, said second inclined surfaces each having an outer peripheral edge forming a second inclined cutting edge contiguous with the respective first cutting edges and more steeply inclined and said second inclined surfaces and terminating at a respective lateral cutting surface on one side of said bore between the first inclined surfaces and at a respective third surface on the opposite side of said bore between the first inclined surfaces, said third surface extending upwardly from the respective second inclined surface at a steeper angle of inclination than said second inclined surfaces



and terminating at said respective lateral cutting surface in spaced relation to said second inclined surface terminating thereat with the inclinations of the second inclined surface and third surface at the respective lateral cutting surface together exceeding 90° when viewed perpendicular to said axis in the direction of said respective lateral cutting surface, said respective lateral cutting surfaces sloping laterally upwardly from opposite sides of said bore in opposite directions between said respective second surface and third surface to the respective second cutting edge and extending upwardly above the working face from the opposite sides of said bore with said bore interrupting and separating the lateral cutting surfaces such that they are positioned above the working surface at the opposite sides of said bore to a sufficient height that the lateral cutting surfaces together form lateral cutting means extending across the working face except for said bore to cut competely across the slug to split it into two pieces on opposite sides of the hole in the workpiece, said first and second cutting edges cutting the slug periphery.

4,543,723

SAFETY ARRANGEMENT FOR A HAND-HELD, POWER-DRIVEN PORTABLE TOOL

Manfred Bortfeld, Leutenbach; Eberhard Schieber, Backnang, and Günter Dietzsch, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,565

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216446

Int. Cl.⁴ B27B *17/02*

U.S. Cl. 30—381 **22 Claims**

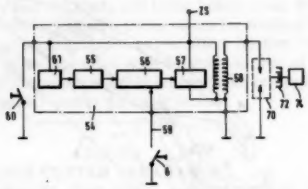
1. A safety arrangement for a portable tool driven by a gasoline motor such as a motor-driven chain saw or the like, the portable tool including a housing equipped with two handles both of which are grasped by the operator to hold and guide the tool during use thereof, one of the handles being a bail handle mounted at the forward part of the housing; and, a movable cutting tool for performing the work of the portable tool; the safety arrangement comprising:

speed-dependent mechanical coupling means for coupling said working tool to said motor when the rotational speed of the latter increases beyond a predetermined value thereof and for decoupling said working tool from said motor when the rotational speed of the latter falls below said predetermined value thereby disabling said working tool so as not to constitute a danger to the operator;

an electronic control device operatively connected to said motor for maintaining the speed thereof below said predetermined speed when said device is activated;

two switches associated with respective ones of said handles and operatively connected to the motor so as to cause the same to be operative only when both switches are closed; and,

the one switch associated with said bail handle including: first and second contacts; at least one of said contacts



being made of a resilient material and being mounted with respect to said bail handle so as to be resiliently deformable from a first position whereat said bail handle switch is open to a second position whereat said contacts come into mutual contact and said bail handle switch is closed; and elastic means for acting on said one contact to effect said deformation to said second position in response to pressure applied to said elastic means by the operator of the tool when grasping the bail handle;

said electronic control device including control circuit means incorporating said one switch for maintaining said device in the deactivated condition so long as said one contact remains in said second position.

4,543,724

MEASURING DEVICE FOR OBLIQUE ANGLE

Kazuo Shiba, and Masakazu Miyashita, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 551,885

Claims priority, application Japan, Nov. 24, 1982, 57-204580; Dec. 7, 1982, 57-214321

Int. Cl.⁴ G01C *1/00*

U.S. Cl. 33—1 N **4 Claims**

1. A measuring device for oblique angle, comprising:

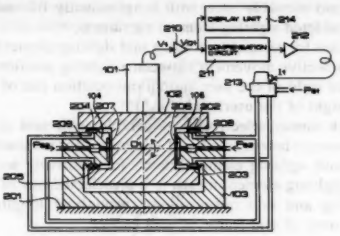
(a) a support member placed on a surface to be measured;

(b) an oblique table rotatably supported by at least a pair of static pressure bearings on said support member; and

(c) an oblique angle detector placed on said oblique table to detect an oblique angle of said oblique table, whereby applied pressure to said static pressure bearings in controlled to thereby always render a detection signal of said oblique angle detector zero, and

further comprising at least one pair of first static pressure pads provided opposedly to said static pressure bearings, a

servo-valve for supplying working pressure corresponding to the detection signal of said oblique angle detector, a servo-amplifier adapted to drive said servo-valve, and a



plurality of second static pressure pads for applying working pressure generated from said servo-valve in a direction wherein the detection signal of said oblique angle detector is zero.

4,543,725

RING GAUGE FOR CHECKING EXTERNAL DIMENSIONS

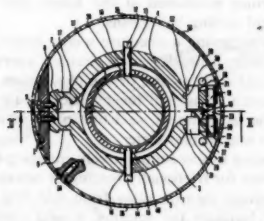
Guido Golinelli, and Mario Possati, both of Bologna, Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed May 8, 1984, Ser. No. 608,174

Claims priority, application Italy, Jun. 10, 1983, 3458 A/83

Int. Cl.[4] G01B *5/08, 7/12*

U.S. Cl. 33—178 E **20 Claims**



1. A ring gauge for checking external diameters of parts, comprising:

support means;

two movable measuring arms having first ends movably coupled to the support means for performing angular displacements, the measuring arms having substantially oppositely arcuated shapes and defining relevant free ends;

two feelers respectively fixed at substantially intermediate sections of the measuring arms for contacting the surface of the part to be checked; and

transducer means including two elements respectively fixed at the free ends of the measuring arms, for providing a signal depending on the mutual positions of the feelers.

4,543,726

APPARATUS FOR ASCERTAINING THE POSITIONS OF OPENINGS IN BULKY WORKPIECES

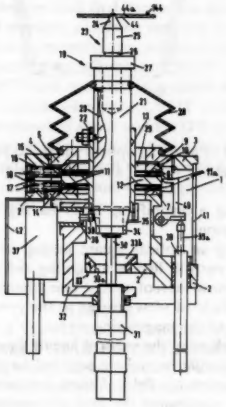
Gerhard Lauer, Grosswaldstrasse 6, D-6686 Eppelborn; Alfred Morawietz, Oderring 13, D-6610 Lebach, and Jürgen Wild, Am Stehlsberg 4, D-6601 Riegelsberg, all of Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,607

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241747

Int. Cl.[4] G01B *7/31*

U.S. Cl. 33—180 R **23 Claims**



1. Apparatus for ascertaining the extent of deviation between the desired position and the actual position of an opening having a predetermined size and being provided in a workpiece, especially of a round hole in a bulky workpiece consisting of sheet metal or the like, comprising a mandrel having a main portion arranged to fit snugly into the opening and a front portion which is receivable in the opening with at least some clearance and merges into said main portion to move the mandrel laterally when it strikes the surface surrounding the opening prior to entry of the main portion; means for supporting said mandrel in a starting position wherein said main portion is in at least substantial register with an opening which is held in the desired position, said mandrel being movable axially with reference to said supporting means to thereby introduce said portions thereof into or to withdraw such portions from the opening and said mandrel being further movable in said supporting means laterally away from said starting position in response to establishment of contact between said front portion and the surface surrounding an opening whose actual position deviates from the desired position while said front portion continues to penetrate into such opening, said supporting means including means for confining said mandrel to lateral movements without changes in orientation of the axis of the mandrel; and means for monitoring the extent of movement of the mandrel from said starting position, including a plurality of gauges each arranged to monitor the extent of lateral movement of said mandrel in one of several different directions.

4,543,727

DETERMINATION AND PASSING ON OF A TARGET DIRECTION FOR TANKS

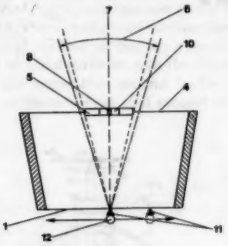
Dietmar Wecker, and Heinrich Lippold, both of Willebadessen, Fed. Rep. of Germany, assignors to IBP Pietzsch GmbH, Fed. Rep. of Germany

Filed Apr. 5, 1983, Ser. No. 482,062

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212729

Int. Cl.⁴ G01C *21/00*

U.S. Cl. 33—228 **5 Claims**



1. A method of using an optical square to position a selected target in the field of view of a magnifying sight comprising the steps of:

(a) providing a magnifying sight having a predetermined magnification;

(b) providing an optical square having in an exit window thereof a vertical line as a sighting aid and having in an entry window thereof at least one selectively positionable indicator field of view related to the predetermined magnification of the magnifying sight;

(c) visually aligning the vertical line of the optical square on the line of sight between a selected target and the selectively positionable field of view indicator of the optical square by positioning the field of view indicator;

(d) providing a control signal in response to the position of the field of view indicator; and

(e) positioning the magnifying sight responsively to the control signal so that the field of view of the magnifying sight will encompass the field of view indicated by the field of view indicator of the optical square.

4,543,728

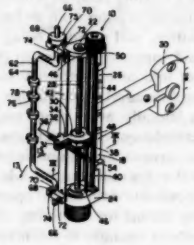
ARCHERY BOW SIGHT

Robert J. Kowalski, 540 Old Plank Rd., Rte. 8, Butler, Pa. 16001

Filed Jun. 15, 1984, Ser. No. 621,173

Int. Cl.⁴ F41G *1/00;* **F41B** *5/00*

U.S. Cl. 33—265 **13 Claims**



1. A bow sight adapted to be mounted on an archery bow to facilitate aiming of an arrow comprising:

an elongated frame,

selectively operable traversing means carried by said frame,

at least one sighting element carrier cooperable with said traversing means to traverse the length of said frame,

sighting element means carried by said at least one carrier and movable therewith longitudinally of said frame to selected sighting element elevations,

means for releasably holding said sighting element means for selective movement between a sighting position in the line of sight of the user and an out-position out of the line of sight of the user, and

lock means selectively cooperable with said at least one carrier independently of said means for releasably holding said sighting element means for positively securing said sighting element means in a preselected one of said sighting and said out-positions throughout longitudinal traverse of said frame by said carrier.

4,543,729

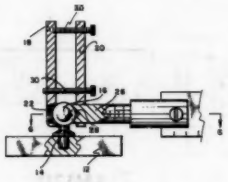
CLAMP FOR A TOOLING BALL AND A METHOD FOR ESTABLISHING A PLANE FOR LAY-OUT PURPOSES

Glenn E. Holbrook, 2226 S. Walnut, Wichita, Kans. 67213

Filed Nov. 28, 1983, Ser. No. 555,663

Int. Cl.⁴ G01C *15/06;* **G01B** *11/30*

U.S. Cl. 33—293 **5 Claims**



1. A clamp for a tooling ball comprising a base plate means;

a ball stand means secured to said base plate means;

a tooling ball means including a face and bound to said ball stand means;

and a clamp assembly means rotatably sandwiching said tooling ball means and supporting a scale means, or the like, for rotation about said tooling ball means;

said clamp assembly means having a first plate defining a first aperture positioned at the lower part thereof for seating said tooling ball means;

a second plate having a structure whose lower edge terminates into a generally semi-circular aperture wherethrough said scale means, or the like, passes to rotatably engage said tooling ball means, such as to be movable around the face thereof, said first plate positioned spacedly from said second plate;

and a tensioning means cooperatively engaging said first and second plate for frictionally forcing or relaxing said tooling ball means into or away from said first aperture to retard or facilitate the rotation of said clamp assembly means about said tooling ball means.

4,543,730

LIQUID LEVEL INDICATOR FOR A TILTED CONTAINER

Julian C. Scott, Jackson, Tenn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1984, Ser. No. 578,339

Int. Cl.⁴ G01C *9/00, 9/24*

U.S. Cl. 33—366 **5 Claims**

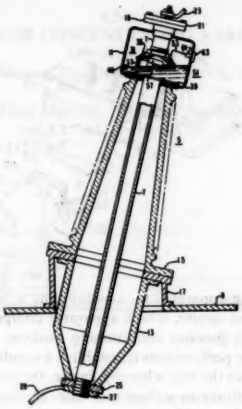
1. A liquid level indicator comprising:

a tubular container having a central obstruction with clearance space between the obstruction and the container;

a liquid in the container around the obstruction and having a liquid level movable between upper and lower levels;

gauge means for indicating the liquid level and comprising a float device, a gear box, and a dial;

the float device including an elongated float arm having opposite ends located on opposite sides of the obstruction and a liquid float on each end so as to move the arm up and down with corresponding movement of the liquid level;



the intermediate portion of the float arm being connected to the gear box for actuating the gear box in response to movement of the arm; and

the dial being coupled to the gear box to indicate the liquid level in response to actuation of the gear box.

4,543,731

GRADIENT MEASURING DEVICES

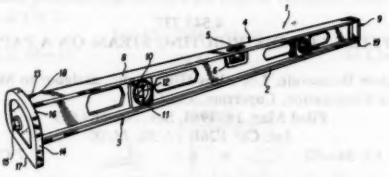
Geoffrey A. Boundy, Heaslip Rd., Angle Vale, South Australia 5117, Australia

Filed Mar. 18, 1982, Ser. No. 359,523

Claims priority, application Australia, Mar. 18, 1981, PE8050

Int. Cl.⁴ G01C *91/00*

U.S. Cl. 33—375 **5 Claims**



1. A gradient measuring device including an elongate member having a lowermost planar face, horizontally determining means secured to the elongate member and adapted to indicate thereby the horizontality or otherwise of the planar face, a gauge member rotatably secured to one end of the elongate member for rotation about an axis extending in the direction of elongation of said elongate member and parallel to said planar face, said gauge member including a portion adapted to extend when the gauge is in any one of a plurality of selected positions relative to the elongate member lower than the otherwise lowermost planar face, and reference markings on the periphery of the gauge member referable with respect to the elongate member and arranged to indicate a measure of the gradient existing between the said portion of the gauge member and a lowermost portion of the elongate member at its end furthermost from the gauge member, when the planar face is horizontal.

4,543,732

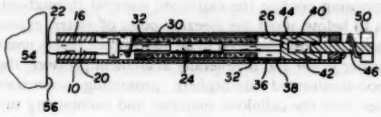
AUTOMATIC NULLING LVDT PROBE

Stephen S. Maples, Adrian, Mich., assignor to Acer Automation Company, Adrian, Mich.

Filed Jan. 20, 1984, Ser. No. 572,504

Int. Cl.⁴ G01B *7/00*

U.S. Cl. 33—502 **12 Claims**



1. A linear variable differential transformer probe comprising, in combination, a support member, first means mounted on said support member for supporting an elongated rod, an elongated rod supported on said first means for axial movement upon said support member, a sensing end and an LVDT core defined upon said rod, second means mounted on said support member for supporting an elongated LVDT coil for axial movement parallel to said rod axial movement upon said support member, an annular elongated LVDT coil mounted on said second means disposed about said LVDT core, and alignment means initially and temporarily being functionally interposed between said rod and coil to produce a known axial relationship between said rod and coil to produce a predetermined initial electrical condition.

4,543,733

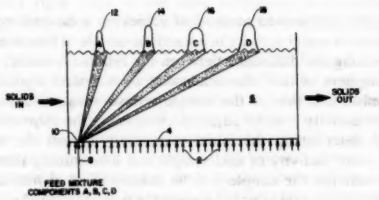
FLUIDITY OF A CONTINUOUS TRANSVERSE FLOW MAGNETICALLY STABILIZED FLUIDIZED BED

Jeffrey H. Siegell, Westfield, and Costas A. Coulaloglou, Morristown, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1982, Ser. No. 345,094

Int. Cl.⁴ F28D *13/00;* **F26B** *17/10;* **C10B** *47/24*

U.S. Cl. 34—1 **21 Claims**



1. In a process for effecting fluid-solids contacting under fluidized conditions wherein a bed of fluidized magnetizable particles is contacted in at least a first contacting vessel with a fluidizing fluid stream which passes through said bed in an ascending manner and said particles are added and removed from a contacting zone, said bed being stabilized by a magnetic means having a strength sufficient to suppress substantial solids backmixing, the improvement which comprises continuously passing said bed of suspended magnetizable particles substantially transverse to the flow of the fluid stream and passing the fluid stream through said bed at an operating velocity such that the ratio of the difference between the transition velocity and the operating velocity to the difference between the transition velocity and the normal minimum fluidization velocity ranges between -0.1 and $+0.5$ so as to achieve enhanced solids fluidity.

4,543,734
TREATMENT OF WATER DAMAGED CELLULOSIC MATERIALS

Richard D. Smith, 224 Early St., Park Forest, Ill. 60466

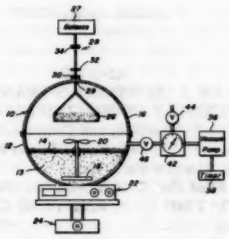
Filed Mar. 19, 1984, Ser. No. 591,027
Int. Cl.[4] F26B 5/06
U.S. Cl. 34—5 20 Claims

1. A process for treating water damaged cellulosic material comprising cooling the cellulosic material throughout its extent to below about the freezing point of water, exposing the cooled cellulosic material to an atmosphere that is unsaturated in water vapor and is generally at ambient pressure, the water vapor-unsaturated atmosphere promoting vaporization of water from the cellulosic material, and maintaining sub-freezing temperatures and a water vapor-unsaturated, generally ambient pressure atmosphere around the cellulosic material until a desired degree of dryness in the cellulosic material is achieved.

4,543,735
METHOD AND APPARATUS FOR THE ACCELERATED ADJUSTMENT OF WATER ACTIVITY OF FOODS AND OTHER MATERIALS

Syed S. H. Rizvi, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 20, 1983, Ser. No. 496,542
Int. Cl.[4] F26B 5/04
U.S. Cl. 34—15 3 Claims



1. An accelerated method of achieving a desired moisture content or water activity in a standard sample of biomaterial by increasing the difference between the relative humidity of the atmosphere within the headspace of a sealed equilibration chamber and that of the sample whose moisture content or water activity is to be adjusted comprising the steps of:

(a) determining the initial water activity and the desired water activity of said sample and determining therefrom whether the sample is to be dehumidified or humidified;

(b) placing said sample on a sample support in the headspace of said equilibration chamber;

(c) establishing and maintaining in said headspace an atmosphere of either 100% relative humidity if the sample is to be humidified or approximately 0% relative humidity if the sample is to be dehumidified;

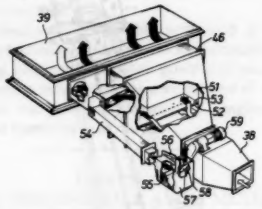
(d) exposing said sample in said headspace to said atmosphere for a predetermined length of time to achieve said desired moisture content or water activity, said length of time having been predetermined by the use of a previously prepared standard moisture content/water activity versus time curve, said curve having been prepared using corresponding samples under the same conditions in the same equilibration chamber; and

(e) removing said sample from said chamber at the conclusion of said predetermined length of time when said sample has not reached an equilibrium with the humidity in said atmosphere in said chamber.

4,543,736
CONDITIONING APPARATUS

Derrick W. Brooks, 18 Ridge La., Radcliffe on Trent, Nottingham, and Christopher P. Morris, 303 Oakdale Rd., Carlton, Nottingham, both of England

Filed May 27, 1983, Ser. No. 498,790
Int. Cl.[4] F26B 21/06
U.S. Cl. 34—46 10 Claims



1. Conditioning apparatus for conditioning a leaf vegetable material of fibrous nature, which apparatus comprises a perforate bed whereby gaseous conditioning medium may be supplied through the perforations to establish a conditioning zone immediately above the bed whereby, in use, the material can be maintained effectively in a fluidized state, the bed being supported above a plenum chamber arranged to be supplied with conditioning medium,

the conditioning medium being supplied from means comprising an inlet duct for conditioning medium under pressure, said inlet duct communicating with a first and second duct each communicating with said plenum chamber, heating means provided in said first duct;

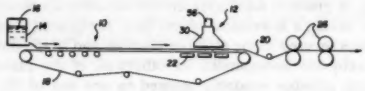
bleed-off means associated with at least one of said first and second ducts whereby the relative proportions of heated and unheated conditioning medium entering the plenum chamber can be adjusted;

the bed being supported in a frame in a manner which permits adjustment of the configuration of the bed relative to the frame at least in a direction of feed of the material to be conditioned, and in which the bleed-off means is controlled automatically to respond to a measurement of a condition of the material being conditioned.

4,543,737
SYSTEM FOR DISTRIBUTING STEAM ON A PAPER WEB

Mathew Boissevain, Los Altos Hills, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Mar. 14, 1984, Ser. No. 589,609
Int. Cl.[4] F26B 13/30, 13/00
U.S. Cl. 34—92 7 Claims



1. A system for distributing steam on a paper web, the system comprising:

(a) a hood located to one side of the paper web;

(b) means to introduce steam into the hood;

(c) vacuum box means located to the side of the web opposite said hood to apply a vacuum to the web;

(d) vacuum release means coupled to said hood to:

(i) provide a space between the paper web and the vacuum release means, the space having a predetermined first height to restrict the flow of air into said hood when steam is being introduced to said hood; and

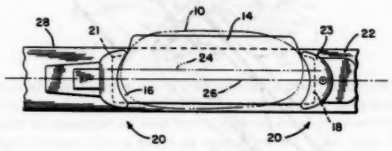
(ii) provide a space between the paper web and the vacuum release means, the space having a height greater than the predetermined first height to permit a substantial flow of air to enter said hood when vacuum is applied to said vacuum box means while steam is not being introduced into said hood.

4,543,738

SKI BOOT FOR CONCENTRATING A SKIER'S WEIGHT ON A SKI EDGE

Morton M. Mower, Five Roland Brook Ct., Lutherville, Md. 21093

Filed Mar. 30, 1982, Ser. No. 363,649
Int. Cl.[4] A43B *5/04*; A63C *9/00*
U.S. Cl. 36—117 **11 Claims**



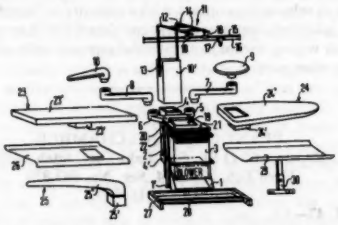
1. A ski boot for use in combination with a ski, said boot having an upper and a sole connected to the upper, said sole including a heelpiece and a toepiece protruding from and integral with the sole and adapted to be engaged by a binding, said heelpiece and said toepiece being offset to the outside of the boot so that the ski boot is clampable to the ski in a position in which the longitudinal centerline of the upper is offset inwardly from the longitudinal centerline of the ski, thereby allowing the weight of a skier more easily to be concentrated over the inside longitudinal edge of the ski.

4,543,739

STEAM IRONING STATION

Georg Zerhoch, Kaufering; Josef Sauter, Schrobenhausen; Richard Kiederle, Stadtbergen, and Günther von Stein, Munich, all of Fed. Rep. of Germany, assignors to Veit GmbH & Co., Landsberg, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,907
Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217872
Int. Cl.[4] D06F *81/08*
U.S. Cl. 38—15 **16 Claims**



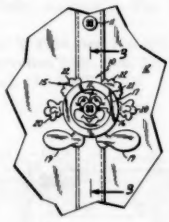
1. In a steam ironing station including: an ironing work table which has an air permeable surface and is arranged above a housing stand, said housing stand having an air guiding chamber; a blower disposed in the housing stand, said blower having a suction or blowing opening communicating with said air guiding chamber, said air permeable surface being in controllable communication with the suction or blowing opening of the blower via said air guiding chamber; and at least one further air connection for optionally supplying an ironing form which is arranged on a swinging arm and likewise has an air permeable surface in controllable communication with the suction or blowing opening of the blower, the improvement comprising the blower together with the air guiding chamber forming an independent housing assembly having a top side and at least one substantially vertical side, said housing assembly including an exhaust air chimney extending upwardly on said vertical side, said housing assembly being provided with a mounting plate on the top side for receiving and holding the ironing work table and with at least one lateral connecting tube stub and an associated swinging arm, the steam ironing station further including a frame-like base with lateral struts and a pedestal, said housing assembly being supported in said struts.

4,543,740

BUTTON WORN NOVELTY DEVICE

Aaron J. Moriarity, Mound, and Charles W. Girsch, St. Paul, both of Minn., assignors to Girsch Design Associates, St. Paul, Minn.

Filed Jan. 16, 1984, Ser. No. 570,968
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—315 **6 Claims**



1. A novelty device designed to be secured to apparel worn by a person by means of a button of the apparel, said device comprising:

a member of flexible material having affixed thereto a representation of a figure;

said flexible material having a reinforcing member of relatively rigid material surrounding a portion of the figure, said reinforcing member being in the form of two relatively rigid rings of the same configuration secured to opposite sides of the flexible material and facing each other; and

said flexible material having a buttonhole formed therethrough within the portion surrounded by the rings of the relatively rigid reinforcing member, said buttonhole being spaced from the rings of the rigid reinforced member so that the device can be secured to the apparel worn by a person by passing a button of the apparel through the buttonhole of the device, the buttonhole being designed to receive the button by reason of the flexibility of the material of the device within the portion surrounded by the reinforcing member.

4,543,741

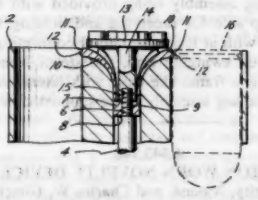
EJECTOR AND CARTRIDGE POSITIONER FOR REVOLVERS

Jonathan W. Phillips, Jr., 1202 Cherokee Hollow Dr., Katy, Tex. 77450

Filed Jun. 21, 1982, Ser. No. 390,705
Int. Cl.[4] F41C *15/00*
U.S. Cl. 42—68 **1 Claim**

1. In a casing ejector for revolvers, a cartridge cylinder having a spring loaded longitudinal axle forming an ejector rod which is movable longitudinally of the cylinder, one end of said rod being diametrically reduced, ejector arms mounted on said diametrically reduced end of said rod, said arms being yieldable and upwardly and outwardly inclined, the extended

ends of each arm having casing engaging means to maintain a cartridge casing in firing position in said cylinder when said rod is in one position, and for ejecting said casing upon longitudinal movement of said rod to another position, said casing



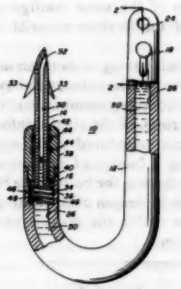
ejector consisting of a cylindrical member having an axial port extending longitudinally therethrough and through which one end of said rod extends, a ratchet plate mounted on the diametrically reduced end of said rod adjacent to said arms, limiting the outward movement thereof.

4,543,742

ANESTHETIC OR ANTISEPTIC INJECTING FISH HOOK

David Rand, Jr., 1900 Palm City Rd., Building 25, Stuart, Fla. 33497

Filed Jun. 14, 1984, Ser. No. 620,615
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.16 **9 Claims**



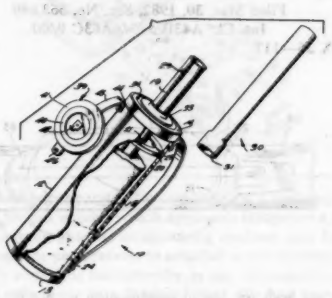
1. A fish hook having a generally U-shaped main body, the hook end of said body having a tubular well open at said hook end and extending from the hook end into said body, said body having a sealable chamber for holding a charge of liquid, said chamber communicating with said well, an elongated tubular member having an outer sharp end telescopically fitted at its other end into said well with a passage through said tubular member from said well to sharp end, and resilient means for urging said tubular member toward the open end of said well, whereby compression of said resilient means by force applied to said sharp end will eject liquid from said chamber through said sharp end.

4,543,743

HERBICIDE APPLICATOR

John H. Keeton, Campbellsville; Lyle S. Keeton, and Eugene G. Keeton, both of Trenton, all of Ky., assignors to Keeton Enterprises, Campbellsville, Ky.

Continuation-in-part of Ser. No. 117,514, Feb. 1, 1980, Pat. No. 4,276,719, which is a continuation-in-part of Ser. No. 101,567, Dec. 10, 1979, Pat. No. 4,276,718. This application Jun. 30, 1980, Ser. No. 164,917
Int. Cl.[4] B05C *1/00*
U.S. Cl. 47—1.5 **30 Claims**



8. A portable liquid applicator device comprising:

a container elongated along an axis and having a first, closed end, and a second end including means defining an opening therein;

a liquid applicator structure including a fibrous exterior portion, shorter than said container, for holding a liquid, and a handle extending therefrom;

wiping means for wiping off a substantial portion, but not all, of the liquid on the liquid applicator structure fibrous exterior portion as the liquid applicator structure is withdrawn through the container second end opening, with the liquid wiped-off draining back into the container; and

means for mounting said wiping means interiorly of said container and spaced from, though adjacent, said container second end a distance sufficient for a portion of said fibrous exterior portion of said liquid applicator structure to be in contact with said wiping means though not in substantial contact with a quantity of liquid disposed in said container at said first end thereof; and spaced from said container first end a distance sufficient for a portion of said liquid applicator structure fibrous exterior portion to be in substantial contact with a quantity of liquid disposed in said container at said first end thereof with no portion of said wiping means in substantial contact with said fibrous exterior portion.

4,543,744

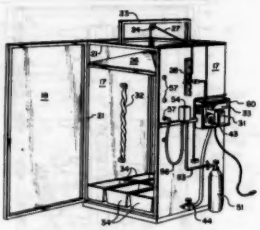
PLANT GROWING CHAMBER

John L. Royster, 60 O St., Salt Lake City, Utah 84103

Filed Feb. 27, 1984, Ser. No. 583,821
Int. Cl.[4] A016 *9/00*
U.S. Cl. 47—17 **2 Claims**

1. An artificial environment growing chamber comprising an upright box defined by four sides and a top within said box, means mounting said top for vertical movement in said box, a door providing access to the inside of said box through one of said sides, the inner surfaces of said walls and said top being coated with reflective material to be at least ninety percent reflective, a horticultural lamp mounted on the inner surface of said top, pan means in the bottom of said box for containing moisture and nutrient, means for supplying moisture and nutrient to said pan means from a source outside said box, root support material in said pan means, air supply means for intro-

ducing diffused air to said box at about the level of said root support means, means including a control valve for supplying carbon dioxide gas to said box at elevations therein above said root support means, and timer means operable simultaneously on said horticultural lamp and said control valve to light said lamp for selected extended timer periods and only during said



time period said lamp is on to intermittently open said control valve to introduce carbon dioxide gas to said box in amounts sufficient to maintain in said box a carbon dioxide concentration that for any given plant in said chamber is at least five times the concentration of carbon dioxide existing in nature during optimum growing conditions for said given plant.

4,543,745

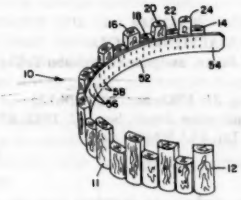
MULTIPLE USE DECORATIVE EDGING

Malcolm Beck, Rte. 3, Box 210TA, San Antonio, Tex. 78218

Filed May 18, 1984, Ser. No. 611,842

Int. Cl.[4] A01G *1/08*

U.S. Cl. 47—33 **4 Claims**



1. Multiple use decorative landscape edging comprised of:

multiple timbers, said timbers being slightly nonuniform in thickness, height and width, substantially all of said timbers having a greater height than width and a greater width than thickness, said timbers being closely aligned, side by side, in a first row of timbers;

a sheet of metal which is sufficiently long to extend at least from its first end at near the first end of said first row of timbers to its second end approximately four (4) inches beyond the second end of said first row of timbers, the portion of said sheet of metal which extends beyond said second end of said row of timbers being a first lip; sufficiently wide to extend from close to the bottom of said first row of timbers to at least two-thirds the average height of said first row of timbers; sufficiently impenetrable to weeds and grass to prevent weeds and grass from growing through it; sifficiently rigid to provide sufficient structural support to said first row of timbers to prevent individual said timbers from being pushed from said sheet of metal; sufficiently strong to retain fasteners driven through said sheet of metal from behind said sheet of metal and into said timbers and sufficiently flexible to permit it to be easily formed into various shapes in the field and installed as decorative landscape edging by human workers without the aid of machinery; said sheet of metal being attached to the rear of said first row of timbers by means of at least an upper row of individual fasteners which are driven through said sheet of metal and into each of said individual timbers in said first row of timbers and a lower row of attachment means comprised of individual fasteners which are driven through said sheet of metal and into each of said individual timbers in said first row of timbers;

said first lip being capable of being used for attaching said second end of said first row of timbers to a first end of any similar row of timbers second by affixing said first lip over a said first end of said sheet of metal located on the rear side of a said first end of said first row of timbers by driving additional fasteners through said lip, said first end of said sheet of metal and into said rear of said timber located at the first end of said any similar row of timbers.

4,543,746

SLIDING DOUBLE DOORS, PARTICULARLY FOR RAILWAY AND TRAMWAY VEHICLES

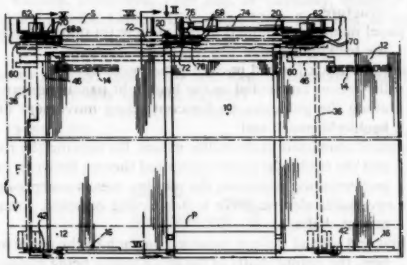
Carlo Racca, Turin, Italy, assignor to Fiat Ferroviaria Savigliano S.p.A., Italy

Filed May 8, 1984, Ser. No. 608,186

Claims priority, application Italy, Jun. 28, 1983, 67704 A/83

Int. Cl.[4] E05F *17/00*

U.S. Cl. 49—118 **4 Claims**



1. Sliding doors, particularly but not exclusively for railway and tramway vehicles, of the type comprising means defining a doorway; two opposing doors movable relative to the doorway between a closed position in which the doors are emplaced in the doorway and closed together and an open position in which the doors are withdrawn from the doorway and spaced from each other; guide means for guiding the doors in their opening and closing movements, and motorised drive means for effecting these opening and closing movements, wherein the improvement consists in the drive means including:

a motorised chain transmission connected to the two doors and movable in one direction and in the opposite direction respectively to effect the simultaneous opening and closing sliding movements of the doors;

respective members connecting the chain transmission to the two doors;

respective rotatable cam means defining an arcuate track for each door, each track having an initial portion in the form of an arc of a spiral and a final portion in the form of an arc of a circle, and

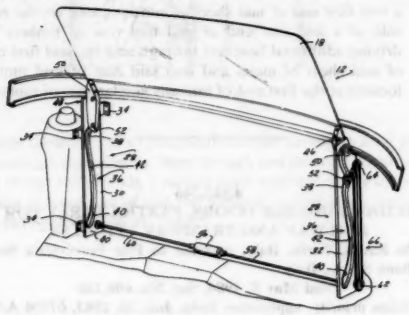
respective feeler means connected to the doors and cooperating with the respective arcuate tracks to effect, in the initial phase of opening sliding movement and in the final phase of closing sliding movement of the two doors respectively, the withdrawal and emplacement of the doors relative to said doorway.

4,543,747

RETRACTABLE BACKLIGHT APPARATUS FOR VEHICLES

Milton C. Kaltz, Allen Park, and Michael P. Alexander, Grosse Ile, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Aug. 25, 1983, Ser. No. 526,559
Int. Cl.[4] E05D *15/28*
U.S. Cl. 49—249 **8 Claims**



1. A retractable backlight panel for a vehicle having a roof structure with a rear window opening comprising:
- a backlight panel for closing the rear opening in the roof structure;
- panel members mounted in the vehicle on opposed sides of the backlight panel;
- a guide track formed in each panel member;
- roller means connected to the backlight panel and movable along the guide tracks for controlling movement of the backlight panel; and
- means connected to the roller means, for moving the rollers and the backlight panel connected thereto between raised and retracted positions, the moving means comprising:
- a reversable electric drive motor having opposed, rotatable output shafts;
- first and second pulleys mounted on each of the panel members, the output shafts of the drive motor being connected to the first pulley for rotating the first pulley;
- means for interconnecting the first and second pulleys for transmitting rotation therebetween; and
- a link, mounted on the interconnecting means and connected to the roller means, for transmitting rotation of the first and second pulley means to translation of the roller means along the guide track.

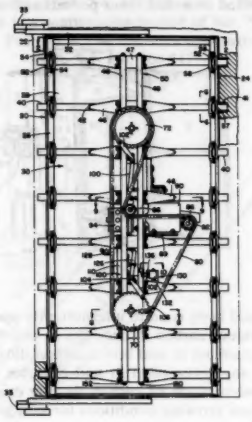
4,543,748

STERILIZER DOOR ASSEMBLY

Howard L. North, Jr., Newfoundland, N.J., assignor to Vernitron Corporation, Lake Success, N.Y.

Filed Nov. 1, 1983, Ser. No. 547,659
Int. Cl.[4] E05C *9/00*
U.S. Cl. 49—395 **9 Claims**

1. A door assembly for a pressure/vacuum vessel such as a sterilizer or the like, for securely closing an opening in a doorway defined by a rectangular frame having therein spaced sockets for receiving locking members, comprising:
- a door adapted to fit in said doorway;
- a plurality of pairs of straight locking bars disposed in parallel array across said door;
- a rail assembly extending across said door perpendicular to said bars and supporting said bars at adjacent ends thereof;
- spring means yieldably engaging opposite end portions of said bars adjacent to opposite edges thereof;
- means for moving said rail assembly laterally away from and toward said door while said bars turn angularly and move axially for selectively engaging in and withdrawing from said sockets, comprising:
- at least one threaded post secured to said door and extending outwardly therefrom;



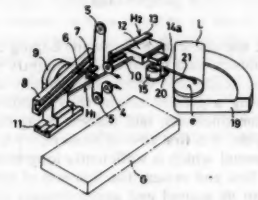
- a threaded means engaged on said post and carried by said rail assembly, so that said rail assembly moves toward and away from said door depending on the direction of rotation of said threaded means; and
- motor means operatively connected to and driving said threaded means.

4,543,749

MACHINE TOOL

Seiji Nakabo, Fukui, Japan, assignor to Nakabo Tekkosho Co., Ltd., Fukui, Japan

Filed Aug. 31, 1983, Ser. No. 528,123
Claims priority, application Japan, Sep. 22, 1982, 57-165327
Int. Cl.[4] B24B *3/06*
U.S. Cl. 51—33 W **3 Claims**



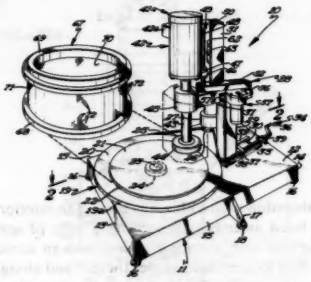
1. A machine tool comprising a workpiece supporting spindle rotatable about its own axis, a wire wound around said workpiece supporting spindle, a wire support to which the opposite ends of said wire are secured, a roller mounted on said wire support, a guide having a longitudinal groove along which said roller is movable, a cradle on which said guide is mounted for continuous rotation to a desired angle, said cradle being slidable parallel to said spindle axis, a tool rest for supporting a tool for grinding a workpiece, a swivel slide on which said tool rest is mounted, said swivel slide being pivotable around a pivot axis which extends through the axis of said workpiece supporting spindle, and a linkage connecting said swivel slide and said cradle and translating the swivelling movement of said swivel slide to straight-line sliding motion of said cradle in the direction parallel to the axis of said workpiece supporting spindle.

4,543,750

APPARATUS FOR REFINISHING A PELLETIZING DIE

Leo Froelich, Box 67, Thief River Falls, Minn. 56701

Filed Jul. 19, 1984, Ser. No. 632,627
Int. Cl.⁴ B24B *19/14*
U.S. Cl. 51—50 R **5 Claims**



1. An apparatus for refinishing the inner cylindrical face of a cylindrical pellet-making die having a plurality of openings therethrough, comprising:

a support base,

a turntable revolvably mounted on said base for rotation relative thereto, means operatively connected with said turntable for rotating the same about a vertical axis, said turntable supporting thereon a pellet-making die so that the axis of the die is vertically disposed,

a vertically disposed pedestal mounted on said base and projecting upwardly therefrom and being horizontally movable relative thereto, means on said base operatively connected with said pedestal for shifting the latter in a rectilinear horizontal path of movement towards and away from said turntable,

a power driven grinder mechanism mounted on said pedestal and being vertically shiftable relative thereto, said grinder mechanism including the horizontally oriented grinding stone revolvable about the vertical axis, means operatively connected with said grinding stone for revolving the same,

means on said pedestal operatively connected with said grinder mechanism for shifting the same vertically in opposite directions whereby, when said grinding stone is disposed in engaging relation with the inner surface of the pellet-making die revolvably supported on said turntable and said grinder mechanism is alternately moved vertically in opposite directions, the inner surface of the die will be refinished.

4,543,751

COMBINED SURGICAL INSTRUMENT POLISHER AND WIPER

Raza Alikhan, 55 Bamburgh Cir., Apt. 1407, Scarborough, Ontario, Canada (M1W 3V4)

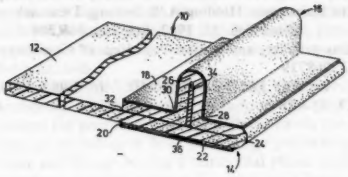
Filed May 23, 1984, Ser. No. 613,320
Claims priority, application Canada, May 24, 1983, 428680
Int. Cl.⁴ B24D *15/04*
U.S. Cl. 51—181 R **8 Claims**

1. A combined instrument polisher and wiper for use with surgical instruments, comprising:

a panel of sponge-like material having an upper surface and a lower surface;

a ridge formed near a first end of said polisher and wiper on said upper surface;

an abrasive surface over the upper surface of said panel in a region thereof near said first end, and on both sides of said ridge and on said upper surface at each side of said ridge;



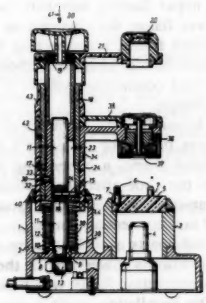
and an adhesive coating on the lower surface of said panel in a region thereof near said first end, and at least below said ridge.

4,543,752

DEVICE FOR CENTERING SPECTACLE LENSES AND FOR FASTENING A HOLDING PART ON THE LENSES

Fritz Kötting, Dormagen, Fed. Rep. of Germany, assignor to Wernicke & Co. GmbH, Düsseldorf-Eller, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,520
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150967; May 14, 1982, 3218241
Int. Cl.⁴ B24B *41/06*
U.S. Cl. 51—277 **11 Claims**



1. A device for centering a spectacle lens positioned precisely for placement thereof via a holding part on said lens, said device comprising:

a mounting base;

a column sleeve arranged vertically on said mounting base and provided with a guide means;

a rotatable casing disposed around said column sleeve and provided with a guide edge; means for height adjustment of said casing relative to said column sleeve, means with which a torque is exerted upon said casing during longitudinal movement thereof relative to said column sleeve, means for holding said guide edge of said casing in sliding engagement and free of play against said guide means of said column sleeve as a result of said torque; and

a swivel arm, which is connected with said casing and supports said holding part.

4,543,753

FLASHING FRAME FOR THE INSTALLATION OF ADJACENT ROOF WINDOWS

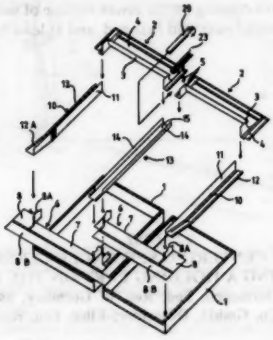
Siegfried Sonneborn, Tangstedt; Manfred Handel, and Ernst Mack, both of Weilheim, all of Fed. Rep. of Germany, assignors to Rasmussen Holding A/S, Soborg, Denmark

Filed Feb. 22, 1983, Ser. No. 468,304

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 32068719

Int. Cl.[4] E04D *13/00;* E04B *7/18;* E06B *1/04*

U.S. Cl. 52—15 6 Claims



1. A flashing frame for installing a plurality of adjacent roof windows inside a blind frame in a plane of a roof, comprising;

a plurality of upper flashing members each having an upstanding cover flange for covering an upper part of an associated blind frame, a connecting flange adapted to extend beneath the roof after installation, and an obliquely rearwardly bent connecting web at a side edge of said connecting flange;

a plurality of lower flashing members each having an upstanding cover flange for covering a lower part of the associated blind frame, a connecting flange adapted to extend onto the roof after installation, and having an obliquely rearwardly bent upstanding connecting web at a side edge of said connecting flange;

a plurality of side parts each having an upstanding cover flange for covering a lower part of the associated blind frame, and a connecting flange which extends beneath the roof after after installation;

at least one trough member installed laterally between two roof windows having two upstanding cover flanges for covering the side parts of two adjacent blind frames; and

at least one connecting bar comprising a cover wall having side edges at which obliquely rearwardly bent coupling webs are oriented to engage the associated connecting webs of two upper flashing members, at least one inward support projection extending inwardly from said cover wall between said coupling webs adapted to be disposed after installation between opposed edges of the connecting webs engaged by said coupling webs, said support projection having support webs extending substantially vertical to the roof plane after installation and adapted to support said engaged connecting webs of two adjacent flashing members, said connecting bar having a width adjusted to a predetermined lateral installation distance between the opposed edges of said engaged connecting webs.

4,543,754

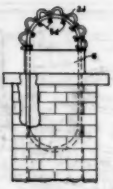
CLIP-ON CHIMNEY HOOD

John A. Cekala, 3134 Pine Ave., Altoona, Pa. 16601

Filed Sep. 28, 1983, Ser. No. 536,614

Int. Cl.[4] E04H *12/28*

U.S. Cl. 52—218 20 Claims



1. In combination with a chimney having an interior opening a chimney hood assembly comprising a loop of spring wire extending across said interior opening, and an arcuate hood attached to said loop at right angles thereto and along substantially the entire extent of said interior opening, the width of said loop being somewhat greater than the said interior opening of said chimney, whereby when the loop is squeezed and inserted into the interior of the chimney, it will expand into frictional line contact with the interior of said chimney.

4,543,755

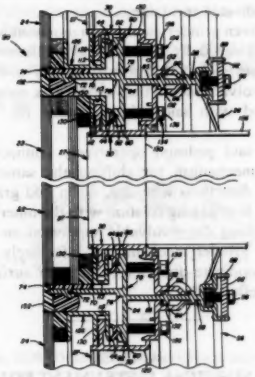
CURTAINWALL SYSTEM

Stephen L. Crandell, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,328

Int. Cl.[4] E04H *1/00*

U.S. Cl. 52—235 21 Claims



1. A panel for a curtainwall of the type having structural members arranged to form a grid, comprising:

a glazing sheet for overlaying an opening defined by the grid and having a surface to face the grid, defined as inner sheet surface; and

a closed moisture and dust resistant frame secured on said inner sheet surface and having a groove which is engaged to maintain said frame on the structural members defining the grid, said frame including at least two hanger section having a joint between ends of adjacent said hanger sections, and a moisture and dust resistant seal over portions of said joint to provide said closed moisture and dust resistant frame.

4,543,756

HEAT-INSULATING FRAME ASSEMBLY FOR USE IN CORNER OF CURTAIN WALL CONSTRUCTION

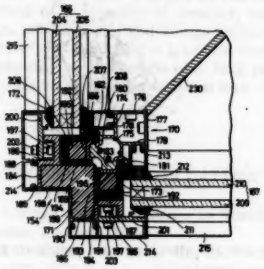
Hiromitsu Kaminaga, and Hiroshi Kondo, both of Kurobe, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 17, 1984, Ser. No. 601,156

Claims priority, application Japan, Apr. 21, 1983, 58-58665[U]

Int. Cl.⁴ E04B *2/88*

U.S. Cl. 52—284 **4 Claims**



1. A heat-insulating frame assembly comprising:

(a) a first frame member including a pair of first and second walls extending substantially perpendicularly to each other;

(b) a second frame member having a pair of third and fourth walls extending substantially parallel to said first and second walls, respectively;

(c) a pair of first and second spacers of a heat-insulating material disposed between said first and third walls and between said second and fourth walls, respectively;

(d) a pair of first and second screws interconnecting said first and third walls and said second and fourth walls, respectively, through said first and second spacers, respectively; and

(e) a block of a heat-insulating material disposed between said first and second frame members.

4,543,757

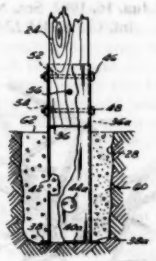
POST SUPPORT AND PROTECTOR

Eunice M. Cosgrove, 25306 Crocker La., El Toro, Calif. 92630

Filed Aug. 8, 1983, Ser. No. 520,914

Int. Cl.⁴ E02D *27/00*

U.S. Cl. 52—295 **8 Claims**



1. A support for mounting an end of a post to the earth, comprising:

a pair of support members formed as separate units, each said support member being formed as an elongate body having a first leg and a second leg extending the length thereof with the second leg being substantially perpendicular to the first leg, each said support member including:

a first portion formed for attachment to a post, the post being retained between the pair of support members with the first legs and the second legs, respectively, positioned face-to-face, the first portion including in each of the first and second legs at least one passage for receiving a fastener to fasten the support members to the post; and

a second portion extending from the first portion for anchoring within the hole to support the post and to protect the post from contact with the earth, the second portion including at least one flange projecting therefrom, said flange having a horizontal planar surface for receiving material thereon for securing a lower end of the support member in the hole.

4,543,758

RAIL AND CAP STRIP FOR SECURING RUBBER ROOF MEMBRANE TO A DECK WITHOUT FASTENER PENETRATIONS

Bennie L. Lane, W-347 S-7194 Sprague Rd., Eagle, Wis. 53119

Filed Feb. 22, 1984, Ser. No. 582,284

Int. Cl.⁴ E04B *5/00*

U.S. Cl. 52—410 **3 Claims**

1. Apparatus for securing a rubber membrane to a surface, the apparatus comprising

an elongated base rail having a bite portion adapted to be secured to the surface, the bite portion including opposite longitudinal edges, and a pair of sidewalls extending upwardly and outwardly from the opposite edges of the bite portion, each of said sidewalls including a rounded upper edge,

means for securing said bite portion of said elongated base rail to the surface,

an elongated cap strip adapted to clampingly fit over said elongated base rail to clamp a portion of the rubber membrane overlaid over the elongated base rail to said elongated base rail without puncturing the membrane, the elongated cap strip including a bite portion adapted to be oriented generally horizontally, the bite portion including opposite elongated edges, one of said edges of said cap strip bite portion being adjacent said rounded upper edge of one of said sidewalls and the other of said edges of said cap strip bite portion being adjacent said rounded upper edge of the other of said sidewalls, and a pair of downwardly extending cap strip sidewalls, said cap strip sidewalls extending downwardly from said opposite edges of said cap strip bite portion, said cap strip sidewalls sloping inwardly so as to converge toward one another, said cap strip sidewalls each including a rounded lower edge, and said cap strip sidewalls being adapted to snap over the upper edges of said base rail sidewalls and adapted to secure said membrane against said base rail and against the surface, and

a rail end cap adapted to be slideably placed over the end of said elongated base rail, said rail end cap including a bite

portion having opposite edges, sidewalls extending upwardly and outwardly from said bite portion of said opposite edges, one end of said end cap including a cavity adapted to house one end of said elongated base rail.

4,543,759

SUPPORT STRUCTURES

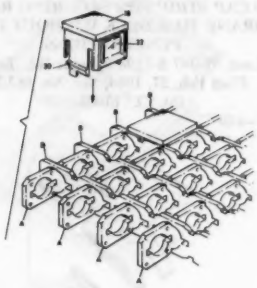
Helmuth H. Rohrer, Krugersdorp, South Africa, assignor to Mosaic King (PTY) Ltd, Krugersdorp, South Africa

Filed Jan. 20, 1983, Ser. No. 459,515

Claims priority, application South Africa, Jan. 21, 1982, 82/0400

Int. Cl.[4] G09F *7/00*; H02B *15/04*

U.S. Cl. 52—475 **8 Claims**



1. A mimic board, comprising a lattice work support structure having a regular array of rectangular apertures for receiving mimic tiles, said structure comprising:

a plurality of like elongate strip members of metallic material arranged in two sets of parallel members, the one set being at right angles to the other set, each member including an array of regularly longitudinally spaced apertures interspaced with waists therebetween, in which the longitudinal dimension of each aperture is greater than the height of the strip members and the lateral dimension of each aperture is smaller than the height of the strip member but greater than the minimum dimension of each waist such that each member of one set, when its minor axis is at least substantially parallel to the major axes of the members of the other set can slide through the apertures of the other set, and can be rotated when its waists are located opposite a respective aperture of the members of the other set, to form the structure;

each said waist comprising two centrally-located, squared-U shaped notches formed directly opposite one another in opposite edges of the respective elongate strip member, each such notch being flanked on both shoulders thereof by respective chamfers of substantial extent which cooperate to form a tapered guide into the respective said notch; and

a respective mimic tile secured in each of at least several of said apertures, at least some of said mimic tiles each comprising:

a face plate bearing a forwardly-presented surface which is constructed and arranged to display information and to substantially fully cover a respective said aperture; and

rearwardly projecting resilient leg means secured to the face plate and constructed and arranged to engage at least two opposed elongate strip members from within a respective said aperture for removably securing the respective said face plate as a covering for said aperture.

4,543,760

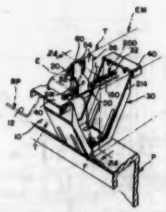
ATTACHMENT CLIP UNIT FOR STANDING SEAM ROOF

W. David Barker; Raymond K. Heisey, Jr., both of Kansas City, and Arturo C. Mariano, Independence, all of Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Nov. 29, 1983, Ser. No. 556,194

Int. Cl.[4] E04D *1/34*

U.S. Cl. 52—544 **26 Claims**



1. A clip unit for attaching roof panels to a building structural element comprising:

a base, said base having a building structural element contacting portion and a plurality of side elements connected to said contacting portion;

a cross-piece mounted on said base side elements to extend across said base;

a one-piece tab element slidably mounted on said cross-piece, said tab element including an elongate body, a pair of first portions each extending outwardly from one end of said body at an angle with respect to said body, and a pair of second portions each extending outwardly from one end of each first portion, said first portions being angled with respect to said body to cross over each other when said body is folded back over itself to be bent around or encircle said cross-piece, said second portions being angled with respect to said first portions to extend away from said cross-piece in a common direction and to be spaced from each other when said tab body is bent around or encircles said cross-piece, said tab element further including means for gripping a panel to attach that panel to said base; and

a tab position maintaining means on said cross-piece for maintaining said tab in a desired position during panel installation.

4,543,761

JOINING TECHNIQUES FOR LARGE STRUCTURES

John Mockovciak, Jr., Dix Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 16, 1982, Ser. No. 389,182

Int. Cl.[4] E04H *12/10*

U.S. Cl. 52—655 **33 Claims**

1. A truss assembly for facilitating the construction of large space structures comprising:

(a) at least two modular sub-assemblies assembled in at least one of a limited plurality of standardized cross and platform interconnecting arrangements, each of said modular sub-assemblies being comprised of at least one triangular truss comprised of a plurality of longerons and a plurality of battens interconnecting said longerons, and

(b) at least one modular interconnecting member interconnecting said triangular trusses in said standardized interconnecting arrangements, said at least one modular interconnecting member being disposed between said triangular trusses and being comprised of at least one connecting joint comprised of a plurality of separate, but readily mated fittings, at least one of said fittings further comprising a plurality of tabs straddling at least one of said longerons and a plurality of said battens of at least one of said triangular trusses for attachment to said at least one triangular truss.

4,543,762

FLEXIBLE TERMINAL POINT FOR LATTICE WORK CONSTRUCTION

Finn Halvorsen, Lidingö, Sweden, assignor to Scanding Byggkonsult Aktiebolag, Lindingö, Sweden

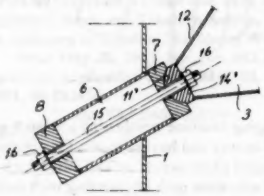
PCT No. PCT/SE81/00291, § 371 Date May 28, 1982, § 102(e) Date May 28, 1982, PCT Pub. No. WO82/01388, PCT Pub. Date Apr. 29, 1982

Continuation of Ser. No. 387,836, May 28, 1982,. This PCT application Oct. 8, 1981, Ser. No. 639,521

Claims priority, application Sweden, Oct. 15, 1980, 8007221

Int. Cl.[4] E04B *1/24*

U.S. Cl. 52—660 **12 Claims**



1. A terminal point for connecting a cross bar of a lattice work to a support strut of the lattice work, wherein the cross bar and the support strut are subject to static and dynamic loads therealong of both tension and compression but the terminal point is only subject to a compression load, comprising:

a junction means fixedly mounted in the support strut for distributing the forces exerted on the cross bar along a length of the support strut adjacent the terminal point;

a compression element including a tube having an inner end and an outer end protruding outwardly beyond the support strut and to which the adjacent end of the cross bar is attached, said tube being fixedly attached to said junction means and located between said junction means and the cross bar such that said compression element receives any compressive forces exerted by the cross bar on the support strut; and

a tension element means for initially compressing said compression element to a load greater than any expected tension load whereby the terminal point receives only a compressive load changing in magnitude, and for attaching the cross bar to said junction means such that said tension element means receives any tension forces exerted by the cross bar on the support strut independent of said compression element and in the same manner that said compression element receives any compression forces independent of said tension element means, said tension element including at least one tie-rod extending centrally through said tube which is threaded at the end adjacent the cross bar and a nut which is received on said threaded end, said nut being used to tension said tie-rod between the inner end of said tube and the outer end of said tube adjacent said cross bar and which thereby initially compresses said compression element appropriately.

4,543,763

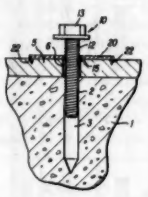
PENETRATION CONTROLLING DEVICE AND SYSTEM

Richard J. Ernst, Palatine, and Kent B. Godsted, Hinsdale, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 22, 1982, Ser. No. 400,812

Int. Cl.[4] E04B *1/38*

U.S. Cl. 52—698 **4 Claims**



1. A system for installing a self-tapping masonry anchor comprising:

a self-tapping masonry anchor having a head with means for rotating said anchor, said anchor having a shank with helical threads thereon, said threads being substantially continuous from one end of said shank to another,

a masonry structure capable of being tapped by said anchor,

a plate placed between said anchor and said structure for the purpose of aiding and controlling the axial advancement of said anchor, said plate having an aperture adapted to continuously engage the threads of said anchor, the combination of elements being designed so that axial and rotational force to said anchor causes said anchor to move in its axial direction, in threaded engagement with said plate while the plate is restrained from rotation wherein the plate controls the rate of axial penetration of said anchor through the plate and into the masonry.

4,543,764

STANDING POLES AND METHOD OF REPAIR THEREOF

Casimir P. Kozikowski, 100 S. Mountain Dr., New Britain, Conn. 06052

Continuation-in-part of Ser. No. 194,771, Oct. 7, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 474,785

Int. Cl.[4] E02D *5/60*; E04G *21/00*

U.S. Cl. 52—746 **18 Claims**

1. A method of enhancing the characteristics of a standing pole comprising the steps of:

supporting a plurality of elongated spacer members about a portion of the exterior surface of a pole, the spacer members being oriented substantially in parallelism with respect to one another;

wrapping a first pliable sheet around the supported spacer members, the sheet having a first substantially straight edge;

marking the first sheet along a line adjacent to the overlapping of the said first edge;

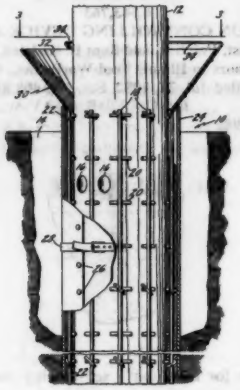
removing the first sheet and severing the said first sheet along the marked line to form a second edge disposed oppositely and parallel to said first edge;

rewrapping the severed sheet around the supported spacer members and forming a leak-proof joint in the vicinity of said first and second edges, the rewrapped sheet defining a cavity about the pole, the spacer members being disposed in said cavity;

forming a pouring funnel about the pole with a second sheet

of material, the smaller end of said funnel being disposed between the pole and said first sheet;

pouring an encapsulating material comprising an epoxy resin into the cavity via the funnel whereby the encapsulating



material contacts and encapsulates the pole along the length of the cavity; and

removing the funnel subsequent to the pouring of said encapsulating material.

4,543,765

UNITIZED FLOOR PANEL AND METHOD OF LAYING THE SAME

Lawrence G. Barrett, 3223 Downing Dr., Lynchburg, Va. 24503

Division of Ser. No. 160,509, Jun. 18, 1980, Pat. No. 4,406,099. This application Jul. 14, 1983, Ser. No. 513,672

Int. Cl.[4] E04F *15/02, 15/16*

U.S. Cl. 52—747 **8 Claims**

1. A method of laying unitized floor panels, each of said floor panels comprising at least one row having a plurality of unattached wooden tiles, each of said tiles having an upper surface and a lower surface and comprising a plurality of slats assembled in a unitary block, each of said tiles being pre-sanded and including an upper surface coated with a finishing composition, a layer of pressure sensitive adhesive covering at least a portion of the upper surface of the tile, and a flexible carrier and protective sheet covering said adhesive and said tiles and being substantially co-extensive with said tiles, the adhesive bond formed between said sheet and said adhesive being stronger than the adhesive bond formed between said adhesive and said tiles, said method comprising:

(a) preparing a sub-floor onto which the panels are to be placed;

(b) spreading a second adhesive onto said lower tile surfaces and between said panels and said sub-floor;

(c) placing said panels onto said sub-floor and applying pressure to said panels;

(d) using said substantially co-extensive flexible carrier and protective sheet and said layer of pressure sensitive adhesive to pull the upper surfaces of all of said tiles into substantial alignment along a generally horizontal plane when said tiles are placed on an irregular surface;

(e) applying a subsequent pressure to said panels; and

(f) stripping said pressure sensitive adhesive layer and said flexible sheet away from said tiles by pulling said sheet from said tiles after said upper surfaces have been pulled into substantial alignment.

4,543,766

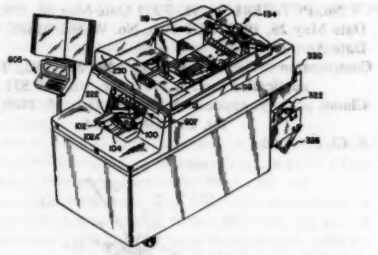
PACKAGING SYSTEM

Edwin E. Boshinski, Englewood, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Feb. 24, 1983, Ser. No. 469,328

Int. Cl.[4] B65B *57/10, 59/02*

U.S. Cl. 53—64 **7 Claims**



1. In a packaging machine comprising a stretch wrap station adjacent a feed-in tray and having means for prestretching film within a horizontal plane across an elevator which is movable along a vertical elevation path intersecting with said horizontal plane wherein packages which are to be wrapped and priced are transported from said feed-in tray to said elevator which in turn elevates the packages into a prestretched section of stretch film to thereby wrap and further stretch said film about said package, the improvement comprising:

weighing means for receiving packages to be wrapped and generating weight signals representative of the weights of said packages;

label generating means responsive to said weight signals for producing pricing labels for said packages; and

label handling means for conveying said labels to a position vertically above said elevator and to a position intersecting with said elevation path of said elevator whereby pricing labels are applied to said packages along the elevation path of said elevator.

5. In a packaging system comprising a film wrapping machine for wrapping known commodities supported upon trays of varying sizes in variously sized sheets of film, means for weighing trayed commodities and computation means for calculating the price to be charged for such trayed commodities based on the weights of the trayed commodities, the price per unit weight of the commodity and the tare weight, the improvement comprising:

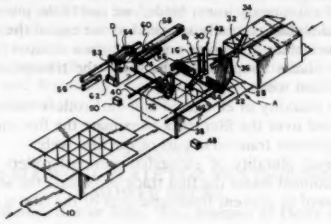
control means comprising sensing means for determining the dimensions of said trays and generating package signals representative of said dimensions; and

said computation means comprising tare generating means coupled to said control means and responsive to said package signals for determining the tare weight to be used for calculating the price for said trayed commodities.

4,543,767
CASE OPENING APPARATUS

John A. Wiseman, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Nov. 8, 1982, Ser. No. 440,187
Int. Cl.[4] B65B 57/04, 43/38
U.S. Cl. 53—76 28 Claims

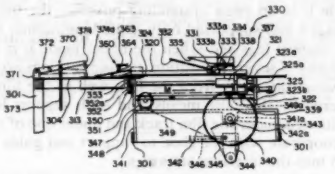


1. Apparatus for opening the flaps of a case or the like comprising leading flap engaging means, means for rotating said leading flap engaging means to engage and partially open the leading flap, means for moving said leading flap engaging means relative to said case to fully open the leading flap and means for actuating said rotating means and thereafter actuating said moving means, in sequence.

4,543,768
AUTOMATIC METHOD AND APPARATUS FOR PACKING STOCKINGS OR THE LIKE

Masao Nishikawa, Nara, and Takahiro Ashida, Kashihara, both of Japan, assignors to Takatori Machinery Works Ltd., Japan

Filed May 28, 1982, Ser. No. 383,152
Claims priority, application Japan, May 30, 1981, 56-83036; Sep. 24, 1981, 56-151876
Int. Cl.[4] B65B 63/04
U.S. Cl. 53—117 9 Claims



1. Automatic stocking packing apparatus, comprising:

first means for intermittently feeding a band of stocking envelopes along a first direction from a point upstream of a stocking insertion position to a point downstream of said stocking insertion position such that each successive stocking envelope of said band is stationed at said stocking insertion position for a respective dwell period, the envelope located at said insertion position at any given instant being referred to as the active envelope, each said stocking envelope having a mouth which faces in a direction perpendicular to said first direction and through which stockings may be inserted into said envelope;

second means for opening said mouth of said active envelope located at said stocking insertion position;

a feeder plate extending in a second direction generally perpendicular to said first direction and having a smooth surface on which a pair of stockings or the like can smoothly slide;

third means for reciprocating said feeder plate along said second direction between a first position in which a front end of said feeder plate is located outside of said active envelope to a second position in which said front end of said feeder plate is located inside said active envelope during each said dwell period of said first means;

fourth means for placing a respective, folded pair of stockings or the like onto said smooth surface of said feeder plate during each said dwell period;

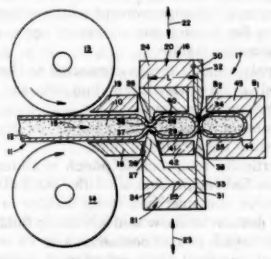
fifth means for pressing said folded pair of stockings located on said feeder plate against said smooth surface of said feeder plate including means for moving said pressing means in said second direction relative to said feeder plate and for sliding said pressed folded pair of stockings across said smooth surface and into said active envelope during each said dwell period by movement of said pressing means in said second direction relative to said feeder plate while said pressing means is pressing said folded pair of stockings against said smooth surface, the timing of fifth means being such that said pair of stockings or the like are not entirely inserted into said active envelope until said feeder plate is located in said second position; and

sixth means for maintaining said folded pair of stockings or the like in said envelope while said feeder plate is being removed from said active envelope.

4,543,769
METHOD AND APPARATUS FOR FORMING AND WRAPPING OBJECTS OF A SOFT MASS

Heinz Schmitz, Hürth-Efferen, Fed. Rep. of Germany, assignor to Rose Verpackungsmaschinenfabrik Theegarten, Cologne, Fed. Rep. of Germany

PCT No. PCT/DE81/00107, § 371 Date Mar. 1, 1982, § 102(e) Date Mar. 1, 1982, PCT Pub. No. WO82/00082, PCT Pub. Date Jan. 21, 1982
PCT Filed Jul. 3, 1981, Ser. No. 355,721
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025507
Int. Cl.[4] B65B 9/12
U.S. Cl. 53—450 10 Claims



1. A method for forming filled candy and chewing gum having a soft outer peripheral coating and a softer encapsulated interior filling comprising the steps of:

(a) feeding an elongated tubular member having a generally cylindrical outer sleeve corresponding to the coating and containing the interior filling, along a longitudinal path;

(b) constricting the tubular member at an intermediate portion to engage the inner surfaces thereof at a transverse bridging section thereby longitudinally separating portions of the interior filling and severing the tubular member simultaneously with the constricting at the bridging section immediately succeeding the bridging section formed by said constricting to seal the free end of the tubular member and form individual objects having a continuous outer coating encapsulating an interior filling; and,

(c) holding the free end of the tubular member during said severing and shifting the severed individual objects between successive constricting and severing steps in a direction transverse to the longitudinal path without change in longitudinal orientation.

4,543,770

APPARATUS FOR PRODUCING AND CHARGING CONTAINERS IN A STERILE ATMOSPHERE

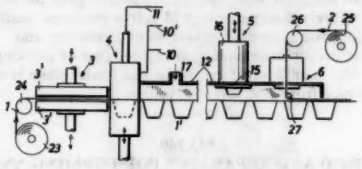
Kurt Walter, Königsberger Str. 8, D-6475 Glauburg 1; Wilfried Gokorsch, Hungener Str. 34, D-6303 Hungen 5; Günter Kurth, Hauptstr. 41, D-6479 Ranstadt 1; Rainer Grusdt, Karl Birx-Str. 33, D-6476 Hirzenhain 1, and Manfred Schreiter, Vogelsbergstr. 22, D-6479 Ranstadt 1, all of Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,785

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207426

Int. Cl.[4] B65B *31/00*

U.S. Cl. 53—511 **2 Claims**



1. In an apparatus for producing a succession of containers from a length of foil, charging the containers and closing the charged containers in a sterile environment, which comprises timed means for advancing the length of foil through successive stations for deep-drawing the pre-heated foil to form respective ones of the containers therein, each container defining a bottom region, charging the containers in succession, and closing the charged containers, and the deep-drawing station including a vertically reciprocable lower portion defining a mold recess for receiving and forming the respective container in the foil and a stationary upper portion associated with the lower portion and defining a chamber in communication with the mold recess, the improvement which comprises

(a) means for heating the stationary upper portion of the deep-drawing station,

(b) a supply conduit means connected to the upper portion for delivering a sterilizing fluid into the upper portion chamber under pressure,

(c) a discharge conduit connected to the upper portion for exhausting the sterilizing fluid,

(d) a vertically reciprocable punch mounted in the upper portion for reciprocation to the bottom region of the respective container and being smaller in size than said lower portion to allow said sterilizing fluid to flow to the bottom region of said container, and

(e) a sterilizing fluid discharge channel passing through the punch and being in communication with the bottom region, the discharge channel being connected to the discharge conduit.

4,543,771

PHOTOGRAPHIC SLIDE MOUNTER

Gerald A. Jensen, Plymouth, and Charles L. Euteneuer, St. Michael, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Jan. 11, 1982, Ser. No. 338,201

Int. Cl.[4] B65B *5/04, 63/00*

U.S. Cl. 53—520 **7 Claims**

1. An apparatus for mounting a photographic film transparency in a slide mount, the apparatus comprising:

a substantially horizontal horizontal film track for supporting a photographic film web only along its longitudinal edges and guiding the film web to an insertion station, the film track having a first end and having a second end adjacent the insertion station;

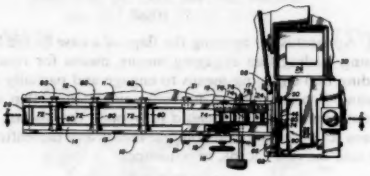
slide mount spreading means for spreading apart portions of the slide mount to form an insertion opening in the slide mount for insertion of the transparency when the slide mount is positioned at the insertion station;

film advance means for feeding the transparency, while still an integral portion of the film web, along the film track and into the insertion opening of the slide mount;

knife means adjacent the insertion station for severing the transparency from the film web at a position outside the slide mount, the knife means having a pivoted upper blade and a stationary lower blade, one end of the pivoted upper blade being pivotally attached to one end of the stationary lower blade at a pivot point to form a scissors type knife, the blades cooperating the sever the transparency from the film web;

a first plurality of elongated anti-curl rollers rotatably positioned over the film track proximate the first end thereof to prevent transverse curl of the film web;

a second plurality of elongated anti-curl rollers rotatably positioned under the film track proximate the second end thereof to prevent transverse curl of the film web;



a pair of curved shoes mounted over the film track proximate the second end thereof, the shoes being positioned only to contact the film web along its longitudinal edges to prevent longitudinal curl of the film web as the film web enters the insertion station; and

a pair of support legs adjacent the second end of the film track and under the film track and the curved shoes to cooperate with the curved shoes to support and guide the film web into the insertion station, the support legs being secured to the pivoted upper blade so that when the upper blade is in an open upstanding position, the film web is engaged and supported only at its longitudinal edges on the support legs and when the upper blade is in a closed downward severing position, the support legs are pivoted downwardly away from the film web as the film web is severed by the knife means, and each support leg being positioned under the film track and under one of the shoes to cooperate with the shoe to support and guide the film web into the insertion station.

4,543,772

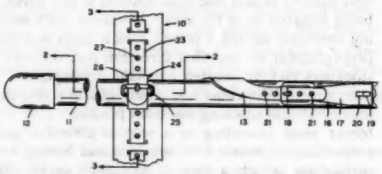
HARNESS

Ronald W. Mitchell, 271 S.E. 5th Ter., Pompano Beach, Fla. 33060

Filed Dec. 19, 1983, Ser. No. 563,032

Int. Cl.[4] B68B *1/00*

U.S. Cl. 54—2 **5 Claims**



1. In a harness adapted to be fitted to a horse and the shafts of a sulky, said harness including a saddle portion extending around the sides and the top of the horse and a girth portion

attached to said saddle portion extending around the sides and chest portion of the horse, the improvement comprising apparatus for attaching a shaft of said sulky to each side of said harness comprising a cup member adapted to be fitted to the forward end of said shaft, an elongated first strap attached to said cup member, means for pivotally attaching said first strap along its length to said saddle portion, means for attaching the remote end of said first strap to the shaft of the sulky aft of said harness, and a shaft loop for further attaching said shaft to said harness comprising a second strap attached to said harness and adapted to encircle said shaft, whereby said shaft and said first strap are substantially aligned along their longitudinal axis and whereby said first strap is aligned substantially transversely with said second strap.

4,543,773

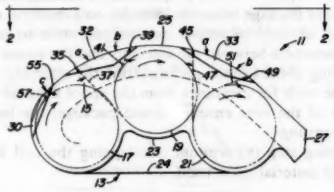
ANTI-BLOWOUT PLATE FOR MULTI-SPINDLE MOWER DECKS

Roger D. Reilly, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 508,220, Jun. 27, 1983, abandoned. This application May 9, 1984, Ser. No. 608,589

Int. Cl.⁴ A01K *35/264*

U.S. Cl. 56—13.6 **3 Claims**



1. In a multi-spindle mower deck having a housing with an open underside rotatably supporting a plurality of planularly aligned mower blades, said housing having a forward sidewall leading to a discharge opening, wherein the improvement comprises a plurality of blow-out plates fixably mounted to said forward sidewall, said blades defining a cutting circle, said blow-out plates extending from said forward sidewall longitudinally and inwardly relative to said housing below said plane of said blades so as not to overlap any portion of said cutting circle.

4,543,774

HARVESTING ATTACHMENT FOR STALK FRUITS STANDING IN ROWS

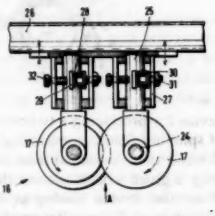
Rudolf Arnold, Saulgau, Fed. Rep. of Germany, assignor to Claas Saulgau GmbH, Saulgau, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,620

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324102

Int. Cl.⁴ A01D *55/18, 35/26, 45/02*

U.S. Cl. 56—98 **9 Claims**



1. An attachment for stalk fruits standing in rows, such as corn, comprising at least one working unit having a picking region; and a cutting device arranged in such picking region of said working unit, said cutting device including two cutting disks rotatable in opposite directions about pivot axles and having partially overlapping cutting edges, at least one of said cutting disks being turnable about a further axle which lies in a working direction of the machine normal to its pivot axle and being held in a frictional engagement with the other of said cutting disks by spring-biasing of the said further axle of said one cutting disk.

4,543,775

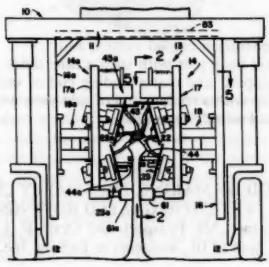
METHOD AND APPARATUS FOR PRUNING CORDON-TRAINED GRAPE VINES

Darrell C. Horn, and Jeffery N. Fletcher, both of Fresno, Calif., assignors to Up-Right, Inc., Berkeley, Calif.

Filed Apr. 23, 1979, Ser. No. 32,260

Int. Cl.⁴ A01D *55/18*

U.S. Cl. 56—235 **22 Claims**



1. The method of spur-pruning a cordon-trained grape vine in which the cordons extending from a vine trunk are trained along a horizontal trellis wire, comprising cutting the spurs along the length of the cordon and at a predetermined and substantially constant distance away from the trellis wire to leave a total number of buds on the pruned spurs of said vine which is substantially equal to a predetermined number.

4,543,776

METHOD FOR YARN PIECING IN FASCIATED YARN SPINNING UNIT

Kazuo Seiki, Kariya; Yoshihisa Suzuki, Chiryu, and Yoshiharu Yasui, Toyota, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Sep. 22, 1983, Ser. No. 534,555

Claims priority, application Japan, Sep. 28, 1982, 57-167476

Int. Cl.⁴ D01H *15/00, 15/02, 5/28*

U.S. Cl. 57—261 **4 Claims**

1. A method for yarn piecing in a fasciated yarn spinning unit, said unit comprising a drafting means having a front pair of top and bottom rollers, a middle pair of top and bottom aprons, and a back pair of top and bottom rollers; an air nozzle; and a yarn detector; whereby a fiber bundle attenuated by said drafting means is false-twisted to be a yarn by a vortex generated in said air nozzle and is wound to form a package under watching for yarn breakage by said yarn detector, said method comprising the steps of:

breaking the fiber bundle between the back pair of top and bottom rollers and the middle pair of top and bottom aprons by stopping rotation of said back bottom roller in accordance with a yarn breakage signal from said yarn detector while allowing the middle aprons and front rollers to continue to rotate;

introducing said yarn unwound from said package reversely into said air nozzle from an outlet at the package side thereof to a yarn inlet at the drafting means side thereof;

separating the top apron from the bottom apron to form a gap therebetween;

guiding the yarn, unwound from the package, from the inlet of the air nozzle through the gap;

nipping said yarn between said middle top and bottom apron pair;

restarting generation of said vortex; and

restarting said back pair with such a time delay after the preceeding nipping step that a leading end of said fiber bundle can overlap with a trailing end of said yarn within a nipping zone of said middle apron pair.

4,543,777

METHOD OF MAKING THERMALLY CURABLE WET-IMPREGNATED ROVINGS

Mark R. Zentner, Mt. Prospect, and Orvid R. Cutler, Rolling Meadows, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 152,571, May 22, 1980, abandoned. This application Feb. 10, 1981, Ser. No. 233,193

Int. Cl.⁴ D06M *15/70;* **B05D** *3/12*

U.S. Cl. 57—295 **5 Claims**

1. A method of producing a thermally curable wet-impregnated roving which can be wound into a wet supply package in which the impregnant does not run and from which the wet-impregnated roving can be withdrawn, comprising impregnating untwisted dry multifilament roving with a heated liquid polyepoxide having dispersed therein a latent heat-activatable epoxy curing catalyst, said polyepoxide dispersion having a room temperature viscosity of from 2000 to 5000 centipoises and a tack of less than about 6 on a Thwing-Albert inkometer, said liquid being heated to an elevated temperature which is insufficient to activate said curing catalyst and functioning to lower the viscosity to enable uniform impregnation of the roving in the absence of volatile organic solvent, and then removing any excess impregnant which may be present.

4,543,778

TEXTILE SPINDLE ASSEMBLY AND METHOD

Ernest Koella, III, 2023 Wayne Cir., Maryville, Tenn. 37801, and Albert D. Harmon, 109 Lakeview Cir., Clemson, S.C. 29631

Filed Mar. 28, 1983, Ser. No. 479,171

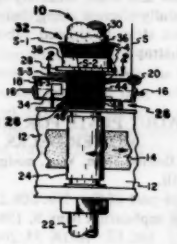
Int. Cl.⁴ D01H *1/38, 9/16*

U.S. Cl. 57—303 **18 Claims**

1. In a textile machine having a rotatable spindle assembly of the type used in the formation of successive yarn packages of textile strand material and including a spool-like member about which coils of the strand material are adapted to be formed preparatory to doffing of each of said packages, said machine having means for freeing said coils for clearance from said member during formation of the next ensuing one of said packages, the improvement comprising:

said spool-like member having strand guiding means for, during formation of said coils, so progressively displacing successive increments of the coil-forming strand material longitudinally of said member as to prevent overlapping of said coil-forming strand material upon itself.

17. In the method of winding strand material extending from a source to a rotatable textile spindle assembly having a first member upon which strand packages are adapted to be successively formed, and a second member spaced along the length of the assembly from the first-mentioned member; said method including the steps of (a) winding strand material upon the first member to form each strand package, (b) winding strand material upon the spool member preparatory to doffing each completed strand package from the assembly so as to form thereon a plurality of coils of strand material effective to maintain strand connection between the assembly and the strand source upon doffing of the formed package from the assembly, and (c) freeing the coils for clearance from the spool member during formation of the next ensuing strand package; the improvement comprising:



completing step (b) without overlapping the coil forming strand material upon itself.

4,543,779

SPINNING DEVICE

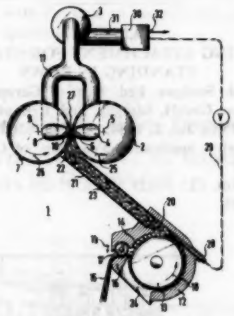
Heinz-Georg Wassenhoven, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladback, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,412

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326671

Int. Cl.⁴ D01H *7/898*

U.S. Cl. 57—401 **8 Claims**



1. Spinning device for producing a twisted thread formed at least partially of spinning fibers, comprising a flow generator having an air inlet and an air outlet, at least one rotating perforated drum having a given axis, a suction device disposed in said drum, said suction device having at least one suction opening disposed substantially parallel to said given axis and connected to said air inlet of said flow generator, another drum disposed outside said first-mentioned drum opposite said suc-

tion opening for forming a spinning wedge from flying fibers, a fiber loosening device for loosening fibers and conducting an air transport current, a fiber conduction channel for conducting the flying fibers and the air transport current from said fiber loosening device to said spinning wedge, means communicating with said fiber conduction channel for increasing the air transport current flowing through said fiber conduction channel, and an air conduction line connected from said air outlet of said flow generator to said air current increasing means.

4,543,780

DRIVE AND MOUNTING FOR AN OPEN-END SPINNING UNIT

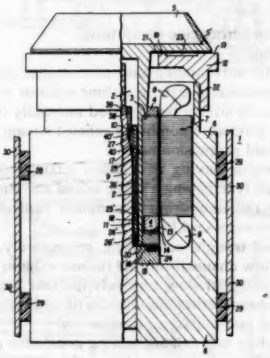
Alfred Müller, Lenzburg, and Harry Seiffert, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 15, 1982, Ser. No. 450,030

Claims priority, application Switzerland, Dec. 22, 1981, 8196/81

Int. Cl.[4] D01H *7/882, 1/244, 7/12*

U.S. Cl. 57—406 **12 Claims**



1. An open end spinning device comprising:

an electric motor cylindrical housing open at a first end and closed at a second end:

a laminated stator in said housing;

a laminated rotor within said stator, said rotor including a hollow shaft and a rotor winding;

an open ended, directly driven spinning container located on one end of said hollow shaft;

radial bearing journal means fixed to said second end of said housing and extending into said hollow shaft for guiding the rotation of said rotor such that a hollow space is formed between said journal means and said hollow shaft;

a radially centering bearing body joint fixed to said journal means;

a sleeve-shaped bearing carrier fixed to said joint and mounted over said journal means via said joint so as to surround said journal means with play whereby said carrier is elastically pivotally connected to said journal means for damping dynamic imbalances of said rotor; and

axial bearing means mounted in said housing for supporting said hollow shaft.

4,543,781

ANNULAR COMBUSTOR FOR GAS TURBINE

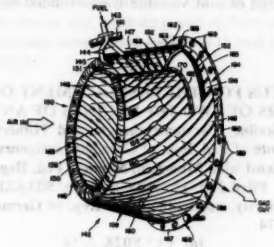
Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, and Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, said Ser. No. 274,660, is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, said Ser. No. 224,496, is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953.

This application Apr. 19, 1983, Ser. No. 486,495

Int. Cl.[4] F02C *3/14*

U.S. Cl. 60—39.36 **21 Claims**



1. An annular combustor liner for forming a combustion gas comprising; means to direct compressed air into the annular space of said combustor liner, means to direct a combustible fuel and mix with said compressed air in the annular space of said combustor liner, means to ignite said combustible fuel with said compressed air and form a combustion gas, said annular combustor liner being formed by a plurality of U-shaped elements placed adjacent to each other, the bend of said U-shaped elements forming the dome of the combustor liner and the respective legs of said elements forming the inner and outer surfaces of said combustor liner and confining said annular space, said elements being placed askew to the linear axis of said combustor liner.

4,543,782

GAS TURBINE ENGINE FUEL CONTROL SYSTEMS

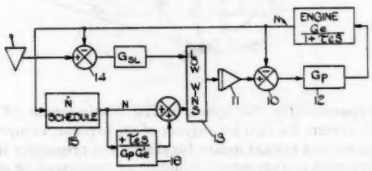
Ian P. Fitzmaurice, Solihull, England, assignor to Lucas Industries, Birmingham, England

Filed May 16, 1983, Ser. No. 494,995

Claims priority, application United Kingdom, May 21, 1982, 8214828

Int. Cl.[4] F02C *9/28*

U.S. Cl. 60—39.281 **7 Claims**



1. A gas turbine engine fuel control comprising a transducer means responsive to an operational variable of the engine and providing a feedback signal representing the acutal value of said variable, a demand signal setting means providing a demand signal representing a desired value of said variable, comparator means comparing said demand signal with said feedback signal and providing an error signal representing the error between the demanded and actual values of said variable, limit signal generating means connected to said transducer and providing a limit signal representing the maximum permitted rate of change of the variable, correction signal generator

means connected to said limit signal generating means and providing a correction signal dependent at least in part on the rate of change of said limit signal, limit signal correcting means connected to said limit signal generator and to said correction signal generator means and providing a corrected signal dependent at least in part on the rate of change of said limit signal, signal selection means connected to said limit signal correction means and to said comparator means and providing a control signal which is the lesser of the error signal and the corrected limit signal, and servo fuel control means connected to the signal selection means and to the transducer means and operating to control the fuel flow to the engine such that the rate of change of said variable is determined by said control signal.

4,543,783

APPARATUS FOR THE DISPLACEMENT OF THRUST REVERSERS OF TWO JET ENGINES OF AN AIRPLANE

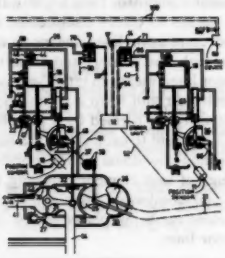
Christian Greüne, Furstenfeldbruck, and Hilbert Holzhauer, Stetten, both of Fed. Rep. of Germany, assignors to Motoren- und Turbien-Union Munchen, Munich, Fed. Rep. of Germany

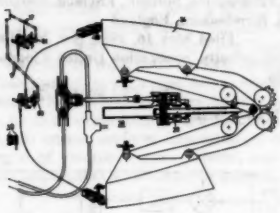
Filed Jun. 13, 1983, Ser. No. 503,633

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222674

Int. Cl.⁴ F02K *1/54*

U.S. Cl. 60—226.2 **20 Claims**





1. Apparatus for the synchronized displacement of two thrust reversers for two jet engines of an airplane, comprising first and second system means for displacing respective thrust reversers, each system means including a compressed air motor means; valve means for controlling the operation of said motor means by controlling the flow of compressed air thereto; and setter means connected to said valve means for operating said valve means for controlling the displacement of the respective motor means; and synchronizing means for automatically synchronizing the displacement of the two thrust reversers including means for measuring displacements in the first and second system means at respective corresponding locations, comparing means for comparing the displacements measured in the first and second system means and means connected to the comparing means and to said setter means of said first and second system means for controlling the operation of said first and second motor means in response to the comparison of the displacements measured such that the displacements of the two thrust reversers by the respective motor means are automatically equalized.

4,543,784

EXHAUST FLOW MIXERS AND NOZZLES

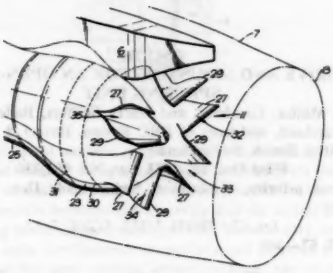
Timothy J. Kirker, Alvaston, England, assignor to Rolls-Royce Limited, London, England

Continuation of Ser. No. 548,016, Nov. 1, 1983, abandoned, which is a continuation of Ser. No. 288,370, Jul. 30, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 646,048

Claims priority, application United Kingdom, Aug. 15, 1980, 8026686

Int. Cl.⁴ F02K *3/02*

U.S. Cl. 60—262 **10 Claims**



1. A turbofan aeroengine comprising:

a core engine;

a bypass duct surrounding said core engine and having a single propulsion nozzle, a turbine exhaust stream and a bypass fan air stream being mixed internally of said aeroengine to produce a combined exhaust stream for passage through said propulsion nozzle;

said core engine having an exhaust mixing nozzle of the multi-lobed type having a shape in end elevation comprising lobes radiating from a common central area with troughs between said lobes;

said lobes and troughs comprising, respectively, outwardly directed flow channels for said turbine exhaust stream and inwardly directed flow channels for said bypass fan air stream to mix a substantial portion of said turbine exhaust stream and said bypass air stream; and

means including said exhaust mixing nozzle for providing a Coanda Effect to those portions of said turbine exhaust stream and said bypass air stream flowing past said exhaust mixing nozzle, for generating multiple vortices of a mixed turbine exhaust stream and bypass fan air stream downstream of said exhaust mixing nozzle, and for mixing a substantial portion of said turbine exhaust stream and said bypass fan air stream to produce a combined mixed exhaust stream for passage through said propulsion nozzle, said means including;

said exhaust mixing nozzle being formed of a plurality of twisted flow surfaces, said twisted flow surfaces having upstream and downstream ends and having a predetermined and progressive degree of twist between said upstream and said downstream ends,

peripherally adjacent ones of said twisted flow surfaces being of mutually complementary and opposite twists to define said outwardly and inwardly directed flow channels of said lobes and said troughs,

said peripherally adjacent twisted lobe surfaces being peripherally adjoining at least at their upstream ends and over at least a major portion of said inwardly directed flow channels;

said twisted flow surfaces providing a Coanda Effect to

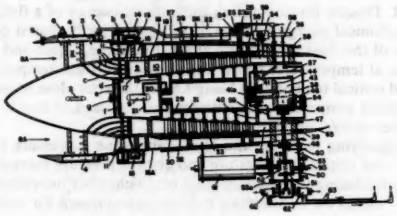
those portions of said turbine exhaust stream and said bypass fan air stream flowing over said flow surfaces to deflect said stream portions without said stream portions breaking away from said flow surfaces and generating multiple vortices of a mixed turbine exhaust stream and bypass fan air stream downstream of said downstream end of each of said flow surfaces, adjacent circumferential ones of said vortices being counter-rotating to promote further mixing, said exhaust mixing nozzle thereby producing a mixing action substantially thoughout said combined exhaust stream before passage of said combined exhaust stream through said propulsion nozzle.

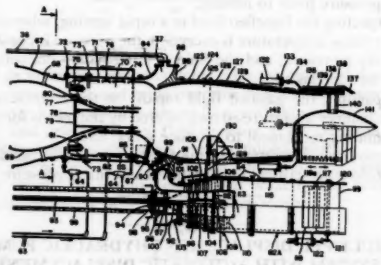
4,543,785

TURBO-RAM-JET ENGINE

Hugh Patrick, Flat 3, 55 Holmes Rd., Moonee Ponds, Victoria, Australia

Filed Jul. 7, 1983, Ser. No. 511,487
Claims priority, application Australia, Jul. 7, 1982, 85718/82; Aug. 18, 1982, PF5436
Int. Cl.[4] F02G *1/00*
U.S. Cl. 60—263 **7 Claims**





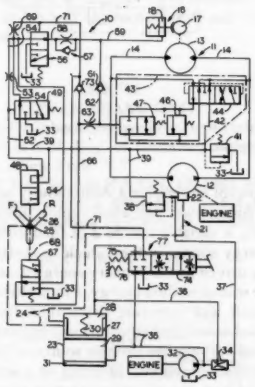
1. A high-speed, high-altitude aircraft jet engine capable of operating in a turbo-jet or a ram-jet mode, or a combination thereof, said engine comprising: air intake means adapted to receive an inflow of air due to forward motion of the aircraft; means for dividing said inflow air into a first inflow portion and a second inflow portion; a compressor adapted to receive and compress said first inflow portion; a combustion chamber downstream of said compressor and adapted to receive an air feed including said compressed air, said combustion chamber including a primary region and a secondary region; first bypass means downstream of said air intake means and upstream of said compressor capable of admitting said second inflow portion to a bypass passage to enter said combustion chamber substantially as ram air and bypassing said compressor; confluence means upstream of said combustion chamber for combining said compressed air and said ram air; valve means for regulating the relative proportion of compressed air and ram air entering the combustion chamber; a plurality of primary burners in said combustion chamber and adapted to admit fuel to said primary region to generate a high-temperature first gas portion in said primary region of said combustion chamber; a plurality of secondary burners in said combustion chamber and adapted to admit fuel to said secondary region to generate a lower temperature second gas portion in said secondary region of said combustion chamber; a turbine downstream of said secondary region of said combustion chamber and drivable by said second gas portion; duct means for conveying said second gas portion from said combustion chamber to said turbine; connection means to establish a mechanical drive connection between said turbine and said compressor; exhaust nozzle means downstream of said combustion chamber; second bypass means capable of conveying said first gas portion to said exhaust nozzle means and bypassing said turbine; and throttle means for selectively controlling fuel flow to said primary and secondary burners.

4,543,786

CONTROL SYSTEM FOR HYDROSTATIC TRANSMISSION

Lucien B. Shuler, Bettendorf, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 14, 1983, Ser. No. 513,548
Int. Cl.[4] B60K *41/20*
U.S. Cl. 60—435 **9 Claims**



1. A control system (**10**) for a hydrostatic transmission (**11**) having a variable displacement pump (**12**) hydraulically connected to a hydraulic motor (**13**), a hydraulically actuated friction brake (**16**) operatively connected to the hydraulic motor (**13**) and displacement control means (**21**) for varying the displacement of the variable displacement pump between zero and maximum displacement positions, comprising:

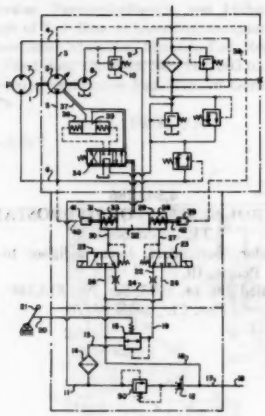
valve means (**77**) for destroking the variable displacement pump to a minimum displacement position greater than zero to establish a predetermined minimum drive condition of the hydrostatic transmission (**11**) and for applying and releasing the friction brake (**16**) while the hydrostatic transmission (**11**) is maintained in said predetermined minimum drive condition.

4,543,787

CONTROLS FOR CONTINUOUSLY ADJUSTABLE DRIVE

Erich Eckhardt, Gross-Umstadt, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 428,260
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143539
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—444 7 Claims



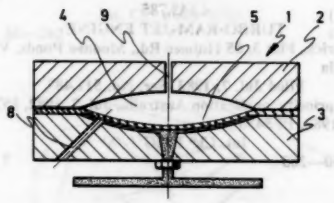
1. In a control system for a continuously adjustable hydrostatic drive for a power propelled vehicle having a plurality of driven shafts, a variable source **2** of fluid energy driven by a primary energy source in the vehicle, a constant source **8** of fluid energy driven by the primary energy source in series with the variable source of fluid energy, a fluid drive **7** connected to a driven shaft and receiving drive fluid from the variable source, a fluid controlled adjusting mechanism **29, 34, 35** connected to and varying the variable source of fluid energy, and including operating cylinder **29** acting on a servo valve **34** and an arbitrarily variable direction control means **23, 25** fluid connected to said operator cylinder **29**, the improvement comprising a fluid line **11** receiving pressure fluid from the constant source of fluid energy, a variable restrictor in said fluid line, an arbitrarily actuable pressure regulating valve **15** connected to the fluid line **11** between the constant source of fluid energy **8** and the variable restrictor **12** and receiving pressure fluid therefrom, connectors **19, 22, 24** from said arbitrarily actuable pressure regulating valve **15** to said arbitrarily actuable direction control means **23, 25** and a connection from said arbitrarily actuable direction control means and the fluid line **11** on the opposite side of the variable restrictor **12** from said pressure regulating valve **15** whereby the variable source **2** of fluid energy is at least partly controlled by the fluid pressure regulating valve **15**.

4,543,788

PROCESS FOR CONVERTING THE INTERNAL ENERGY OF LIQUID CO_2 INTO MECHANICAL ENERGY CAPABLE OF PRODUCING WORK AS IT CHANGES FROM LIQUID TO GAS OVER ITS CRITICAL TEMPERATURE

Dario Monreal Urzay, Sangüesa, 12, Pamplona, Spain

Filed Mar. 16, 1982, Ser. No. 358,796
Claims priority, application Spain, Mar. 27, 1981, 500.786; Nov. 27, 1981, 507.540
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—531 2 Claims



1. Process for converting the internal energy of a fluid into mechanical energy capable of producing work, based on the use of the fluid having two alternative states, liquid and gaseous, at temperatures below and above its critical temperature, said critical temperature being higher than but close to normal ambient temperature, essentially characterized in that it comprises several operative steps:

liquefying the fluid at a temperature and a pressure below the critical temperature and critical pressure thereof;

introducing the liquefied fluid into a chamber provided with means for transmitting movement and means for transmitting heat;

pressurizing the fluid to a pressure at or above the critical pressure prior to heating;

subjecting the liquefied fluid to a rapid heating, whereby the critical temperature is exceeded, the pressure is considerably increased, and the fluid is immediately converted to the gaseous state;

expanding the gasified fluid rapidly in the interior of the chamber against resistence offered by the means for transmitting movement to produce work; and

recovering and returning the fluid to the initial conditions below the critical temperature and critical pressure.

4,543,789

MULTIPLE DISPLACEMENT HYDRAULIC PUMP SYSTEM WITH AUTOMATIC DISPLACEMENT CONTROL FOR BRAKE BOOSTERS AND THE LIKE

Peter Norton, 15612 Hilton, Southfield, Mich. 48075

Continuation of Ser. No. 454,463, Dec. 29, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,846
Int. Cl.[4] F16D *31/02;* F04B *49/08*
U.S. Cl. 60—545 8 Claims

1. A hydraulic brake system for an automotive vehicle comprising:

a hydraulic booster,

a pump system for supplying pressurized fluid to said booster from a reservoir,

said booster including a pressure chamber, an inlet port and an outlet port and including a booster valve adapted to be actuated by a brake pedal and which is movable from a center position to admit pressurized fluid from the inlet port to the pressure chamber or movable from said center position to release pressurized fluid from said pressure chamber to said outlet port,

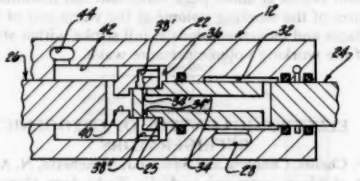
said pump system including,

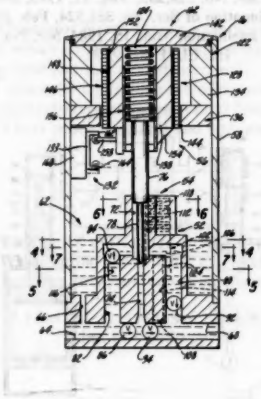
an electric motor,

a low pressure pump and a high pressure pump adapted to be

driven concurrently by said motor, said pumps having respective inlets adapted to be coupled with the reservoir and having respective outlets,

a common discharge passage coupled with the outlet of the high pressure pump and coupled through a one-way valve with the outlet of the low pressure pump and coupled with said inlet port of said hydraulic booster,





and an unloading means coupled with the outlet of the low pressure pump and being operable to enable fluid pumped by the low pressure pump to flow with minimal resistance to said reservoir when fluid pressure in the common discharge passage exceeds a predetermined value,

said pumps collectively having sufficient pumping capacity to supply the requirement of said brake system without supplementary flow from any other source.

4,543,790

MASTER CYLINDER AND BRAKE BOOSTER ASSEMBLY

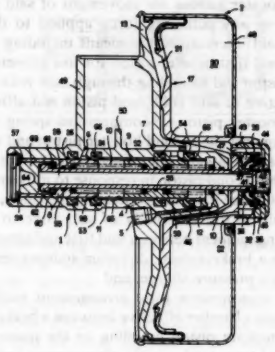
Juan S. Coll; Joaquim F. Bofill, and Juan S. Bacardit, all of Barcelona, Spain, assignors to Bendiberica, S.A., Barcelona, Spain

Continuation of Ser. No. 283,592, Jul. 15, 1981, abandoned. This application Mar. 2, 1984, Ser. No. 585,015

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 **12 Claims**

1. A brake control unit for an automotive vehicle, comprising a low pressure booster with a hermetically closed housing having two opposite walls, and a brake master cylinder connected to a first of said opposite walls, a movable piston wall dividing interiorly said housing into a vacuum chamber to be permanently connected to a vacuum source and a control pressure chamber adjacent the first wall of said housing, said piston wall being movable axially in response to actuation of a control valve by a control rod extending longitudinally through said master cylinder, the control valve being arranged centrally on said movable wall and selectively controlling communication of the control pressure chamber with the atmosphere, said control valve housed in a control valve casing, an opening being formed in the second of said opposite walls and the second wall opposite said master cylinder, said master cylinder having a housing and slidingly receiving therein at least a primary piston connected to said movable wall by an elongated actuation member, means on said master cylinder for mounting said unit on a stationary support of said vehicle, the elongated actuation member being tubular and extending longitudinally centrally through said master cylinder and the control rod extending slidably within the tubular elongated



actuation member, the control valve comprising a first admission valve member on an atmospheric side of said control valve and operatively connected to said control rod, said control valve also disposed in a movable wall tubular hub portion extending axially in the vacuum chamber, the tubular hub portion sealingly extending through said opening in said second wall, the control valve casing in constant communication with the atmosphere and the control valve disposed outside the booster directly in front of the second wall and remote from the master cylinder.

4,543,791

POWER BRAKE UNIT

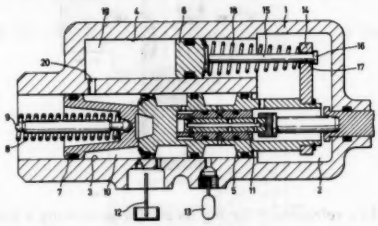
Jochen Burgdorf, Offenbach-Rumpenheim, and Helmut Steffes, Eschborn, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 310,350, Oct. 13, 1981, abandoned. This application Jul. 2, 1984, Ser. No. 626,478

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040602

Int. Cl.[4] B60T *13/20*

U.S. Cl. 6—550 **2 Claims**



1. A power brake unit for automotive vehicles comprising:

a housing having therein first and second parallel bore bearing booster pistons respectively therein, a booster chamber common to said first and second bores and an intermediate pressure chamber bounded on one side by an intermediate piston adapted to be coupled to a master cylinder

piston and on the other side by a first of said booster pistons;

an axially displaceable booster piston arrangment separating said booster chamber from said intermediate pressure chamber, valve means for applying pressure to said chamber to move said piston arrangement, said booster piston arrangement including said first of said booster pistons disposed in one of said first and second bores, a second of said booster pistons disposed in the other of said first and second bores and means interconnecting said first and second booster pistons for movement of said pistons responsive to any actuating force applied to the booster pistons, said interconnecting means including a yoke affixed to said first booster piston for like movement therewith, a piston rod extending through said yoke for movement relative to said yoke, said piston rod affixed to said second booster piston, a compression spring bearing at one end against the second booster piston and at its other end against the inward side of said yoke to limit the movement of the second piston in response to movement of said first piston alone in a brake operating direction, and a stop on said piston rod externally of said yoke to provide a positive engagement between said first and second booster pistons in a brake release direction independent of pressure from a pressure source; and

a hydraulic transmission ratio arrangement including said intermediate chamber effective between a brake pedal and the intermediate piston coupling to the master cylinder piston, said transmission ratio arrangement being disconnectable upon failure of said pressure source.

4,543,792

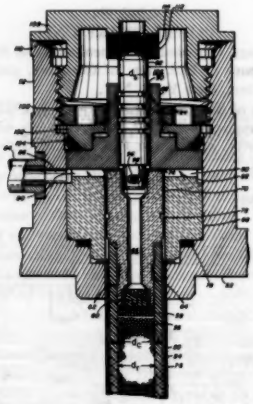
REFRIGERATION SYSTEM WITH CLEARANCE SEALS

Peter K. Bertsch, Pepperell, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 416,349, Sep. 9, 1982, abandoned. This application Nov. 8, 1983, Ser. No. 550,008

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **11 Claims**



1. In a refrigerator having means for generating a pressure wave in a working volume of gas, a displacer which reciprocates in a housing to displace gas in the working volume of gas through a regenerator and a spring volume of gas of relatively stable pressure in contact with an end surface of a drive piston on the displacer and separated from the working volume of gas by a fluid seal surrounding the drive piston, the displacer being driven solely by pressure differentials between the working volume and the spring volume, there being at least one retarding force applied to the displacer to retard movement of the displacer, the improvement wherein:

all fluid seals between the displacer and housing are virtually dragless seals, the only significant retarding force is that resulting from fluid friction between the regenerator and the gas in the working volume, and the displacer and drive piston are sized relative to system pressures at each end of the displacer and drive piston such that displacer movement begins at about peak maximum and minimum pressures of the working volume at the warm end of the displacer and movement ends at full stroke within about 90° of the working volume pressure wave.

4,543,793

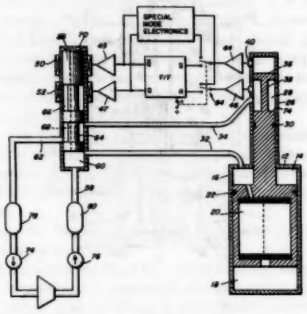
ELECTRONIC CONTROL OF CRYOGENIC REFRIGERATORS

Fred F. Chellis, Concord, and Samuel J. Moschetto, N. Andover, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 528,235, Aug. 31, 1983, abandoned, which is a continuation of Ser. No. 351,524, Feb. 23, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,391

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **21 Claims**



1. A cryogenic refrigerator having a displacer reciprocating in a refrigeration cylinder for displacing refrigeration gas through a regenerator and for expanding and thus cooling the refrigeration gas and gas control valve means for admitting high pressure gas into the refrigeration cylinder and for exhausting the gas from the refrigeration cylinder, the refrigerator comprising:

means responsive to a physical parameter of the refrigerator for providing an electrical indication of that physical parameter; and

electrically operated timing control means responsive to said electrical indication for controlling the relative timing of the displacer movement and operation of the gas control valve means.

4,543,794

SUPERCONDUCTING MAGNET DEVICE

Kinya Matsutani, and Katutoki Sasaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 19, 1984, Ser. No. 632,461

Claims priority, application Japan, Jul. 26, 1983, 58-136604; May 21, 1984, 59-102024

Int. Cl.[4] F17C *13/00*

U.S. Cl. 62—54 **11 Claims**

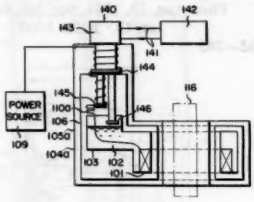
1. A superconducting magnet device comprising:

a cold insulation vessel which is composed of an inner chamber in which cryogen is sealed, and outer chamber for enclosing said inner chamber and a shield member for heat radiation which is provided between said inner chamber

and said outer chamber, said vessel holding a superconducting coil which is enclosed in said inner chamber at a very low temperature;

a power lead for supplying an exciting current to said superconducting coil;

a recondenser for recondensing the evaporated gas of the cryogen in said inner chamber;



small refrigerator means having a plurality of refrigeration stages which are directly and respectively coupled to said power lead and said recondenser; and

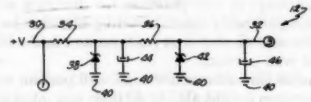
control means for controlling the refrigerating capability of said small refrigerator means in accordance with the quantity of heat penetrating into said add insulation vessel.

4,543,795

TEMPERATURE CONTROL FOR VEHICLE CABIN

David R. Ward, Byron, and William E. Zieske, Rockford, both of Ill., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Jul. 11, 1984, Ser. No. 629,952
Int. Cl.[4] G05D *23/32*
U.S. Cl. 62—158 **6 Claims**



1. A vehicle cabin temperature control comprising:

temperature selector means for selecting a reference temperature within the vehicle cabin;

temperature comparison means responsive to the temperature selector means for outputting a control signal indicative of the relationship of the reference temperature and the actual temperature within the vehicle cabin;

controllable switching means to be coupled between a power source and heating/cooling means, said switching means being responsive to the temperature comparison means for applying electrical power to the heating/cooling means when the control signal has a certain value; and

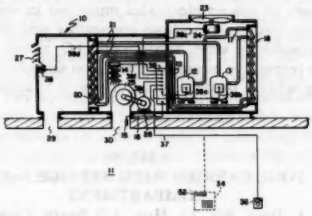
short-circuit protection means coupled to said swithing means, said protection means including current detection means for monitoring the electrical current applied to the heating/cooling means, said protection means further including current interrupting means responsive to said current detection means for interrupting the current to the heating/cooling means when the current exceeds a preselected parameter, said current interrupting means including means for selectively forcing the control signal to a value other than the certain value, whereby said switching means does not apply power to the heating/cooling means.

4,543,796

CONTROL AND METHOD FOR TEMPERING SUPPLY AIR

Doyoung Han, La Crosse, and William G. Hansen, West Salem, both of Wis., assignors to American Standard Inc., New York, N.Y.

Filed Jun. 15, 1984, Ser. No. 621,298
Int. Cl.[4] F24F *7/00*
U.S. Cl. 62—160 **25 Claims**



1. In a system having a plurality of temperature conditioning stages that may be selectively energized so the capacity of the system may be varied to maintain a comfort zone at a setpoint temperature, a control for tempering air supplied to the zone to prevent personal discomfort to occupants of the zone due to excessively cold air being supplied to the zone, said control comprising:

a. a supply air zone temperature sensor;

b. a comfort zone temperature sensor;

c. primary control means responsive to the comfort zone temperature sensor, for controlling the capacity of the temperature conditioning system by selectively energizing stages of temperature conditioning to maintain the comfort zone at the setpoint temperature; and

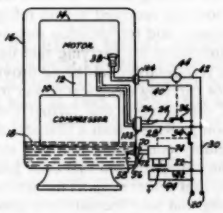
d. secondary control means, responsive to the supply air temperature sensor, for preventing excessively cold air being supplied to the zone by overriding the primary control means and controlling the capacity of the temperature conditioning system to increase the supply air temperature if it should fall below a predetermined minimum value lying in the range from 40° F. to 55° F.

4,543,797

DEGRADATION SENSING AND SHUT-DOWN MEANS FOR REFRIGERATION MOTOR-COMPRESSOR UNITS

Richard E. Vogel, Cincinnati, and Benjamin Bowsky, Maineville, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 499,321, May 31, 1983, Pat. No. 4,490,988.
This application Sep. 21, 1984, Ser. No. 652,839
Int. Cl.[4] F25B *31/00*
U.S. Cl. 62—193 **3 Claims**



1. In an enclosed motor-compressor unit for air conditioning or heat pump service which includes an accumulation of refrigerant-oil mixture in the enclosure, an A.C. electrical power

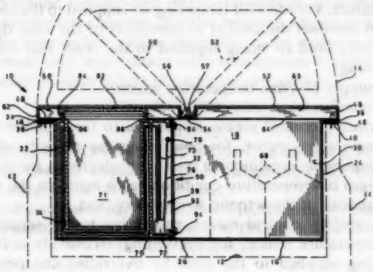
source, circuit connections including a normally closed switch connecting the motor of said unit across said A.C. power source, a relay which when energized opens said normally closed switch thereby to shut-down operation of said unit, means for continuously energizing said relay when contamination of said mixture by conductive particles therein attains a predetermined degree comprising: a source of D.C. electrical power, a silicon controlled rectifier, circuit connections connecting said silicon controlled rectifier and said relay in series across said D.C. power source, a contaminant sensor comprising a pair of spaced electrodes immersed in said mixture, a capacitor, circuit connections connecting said electrodes and said capacitor in series across said D.C. power source, and voltage responsive means for turning on said silicon controlled rectifier when a predetermined charge is attained on said capacitor.

4,543,798

TOOL CARRIER WITH REFRIGERATION COMPARTMENT

Daniel A. Page, Rte. 13, Hwy. 127 North, Crossville, Tenn. 38555

Filed Apr. 13, 1984, Ser. No. 600,036
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—239 **16 Claims**



12. An improved tool carrier for being mounted across the bed of a pickup truck for carrying tools and for carrying various items requiring refrigeration, comprising:

an enclosure comprising forward and rearward side walls, oppositely disposed end walls and a bottom portion, said enclosure further comprising a partition dividing said enclosure so as to define a refrigerator housing and a tool compartment, said oppositely disposed end walls being provided with upper end portions comprising outwardly extending flange portions for engaging said truck so as to support said carrier, with suitable fastening means being provided for securing said flange portions to said truck, said refrigerator housing being provided with a plurality of vents for venting heated air from said housing;

a refrigeration unit received in said refrigerator housing of said enclosure, said refrigeration unit defining a refrigeration compartment for carrying said items to be refrigerated, said refrigeration unit being provided with a wiring harness for carrying electrical power to said refrigeration unit, said refrigeration unit further comprising an upper rim portion provided with a first seal member; and

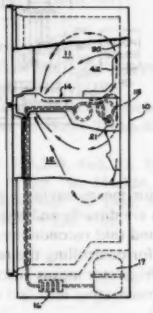
a door assembly comprising first and second door panels, and a center support, said first door panel being pivotally secured to said center support for accessing said refrigerator housing and said second door panel being pivotally secured to said center support for accessing said tool compartment, said first door panel being provided with a secondary closure, said closure including a second seal member for sealably engaging said first seal member of said refrigeration unit when said first door panel is in a closed position so as to seal said refrigeration compartment.

4,543,799

HOUSEHOLD REFRIGERATOR WITH AIR CIRCULATING AND COOLING ARRANGEMENT

Julius B. Horvay, and Robert B. Gelbard, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 23, 1984, Ser. No. 643,686
Int. Cl.[4] F25B *5/00*
U.S. Cl. 62—283 **2 Claims**



1. In a refrigerator cabinet including a fresh food storage compartment to be maintained at a temperature above freezing and a freezer compartment to be maintained at a temperature below freezing, an air circulating and evaporator arrangement comprising:

a partition dividing said compartments including a first wall portion defining the upper wall of said fresh food compartment including an inlet opening, and a second wall portion defining the lower wall of said freezer compartment including an air inlet and an air outlet;

air passageways in said partition for directing air through said compartments communicating between said inlet in said first and second wall portions and said outlet in said second wall portion;

fan means mounted on said second wall portion arranged in said partition for circulating air from said inlets in said first and second wall portions through said evaporator chamber to said outlet in said second wall portion;

an evaporator including a tubular member bent to form at least two interconnected helically coiled portions extending transversely in said evaporator chamber, the longitudinal axis of said coils being substantially parallel to each other and perpendicular to said air circulating from said inlets to said outlets, the axis of one of said coils being elevated relative to the axis of the other coil so that air entering said evaporator chamber from said inlets will impinge on both of said coiled portions of said evaporator to thereby increase the frost tolerance of said evaporator.

4,543,800

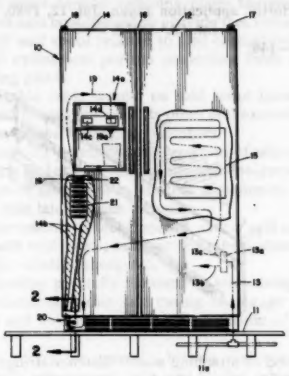
REFRIGERATOR DOOR HINGE

Harold S. Mawby, Belding, and Burdith W. Johnston, Greenville, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 16, 1984, Ser. No. 580,885
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—339 **9 Claims**

1. In a refrigerator having a lower hinge assembly for pivotally mounting a refrigerator door on an associated refrigerator cabinet, the door including a dispensing mechanism for water and/or ice cubes, the dispensing mechanism being located above the lower hinge assembly and being connected to an electrical control circuit of the refrigerator by a plurality of

electrical conductors, the conductors extending downwardly from the dispenser and being connected to the electrical control circuit via the lower hinge assembly, means for precluding fatigue breakage of the conductors caused by localized twisting and untwisting thereof, at a point along their lengths, when the refrigerator door is repeatedly opened and closed, said fatigue breakage precluding means comprising:



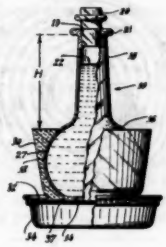
an elongated, generally rigid, tubelike member extending from the lower hinge assembly upwardly to the dispenser, the tubelike member being located in the interior of the door, the tubelike member containing therein said conductors to isolate them from other door structures, said conductors being free to move within said tubelike member so as to allow unimpeded twisting and untwisting of the conductors along their entire lengths within said tubelike member as said door is opened and closed.

4,543,801

COOL BEVERAGE CARAFE SERVER

Bernard J. A. Damiens, 11, rue Emile Dubois, 75014 Paris, France

Filed Nov. 28, 1984, Ser. No. 675,830
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **3 Claims**



1. A cooled beverage serving system for cooling, serving and continuing to cool a beverage without dilution while the beverage is awaiting being served comprising:

a carafe for holding the beverage which is to be cooled without dilution,

said carafe having an elongated neck extending up from a bulbous body portion capable of being hand held by said neck,

said body of the carafe has a bottom with an outwardly facing annular shoulder,

a mold having a cross-sectional area sufficient to house the body of said carafe immersed in water to a level above the equatorial region of said bulbous body,

said mold having a side wall diverging upwardly outwardly at all levels therein and having a rim height spaced above the equatorial region of said body,

said mold has an inwardly facing annular shoulder complementary to the bottom shoulder for centering the carafe in alignment with the axis of the mold for causing the body of the carafe to be centered within said ice ring,

said mold, and water and carafe being adapted for placing in a freezer for the water contained therein to be frozen around said carafe forming an integral ice ring captured in embracing relationship above and below the bulbous equatorial region of the body of said carafe, and

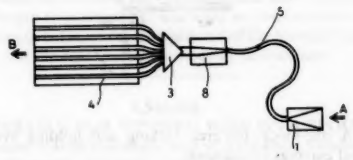
a serving tray having a suspended support spaced above the tray bottom adapted to have said carafe and its integral ice ring rest thereon on a dinner table for collecting the water from the melting ice ring on said carafe, while said carafe is resting thereon awaiting serving.

4,543,802

EVAPORATING APPARATUS

Hans-Joachim Ingelmann, Iggingen-Schönhardt, and Hans Kampf, Stuttgart, both of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,561
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327179
Int. Cl.[4] F25B *39/02*
U.S. Cl. 62—525 **15 Claims**



1. In an evaporator apparatus, especially for air-conditioning units of motor vehicles, having an evaporator assembly with several evaporator pipes and coolant supply means comprising an expansion valve, a flow divider for dividing the coolant flow, and connecting means between the expansion valve and the flow divider, said connecting means having at least one bend, the improvement comprising mixing means, disposed in the coolant flowpath directly upstream of an inlet to the flow divider, for causing gaseous and liquid components of the coolant flow to form a homogeneous mixture at said inlet to the flow divider.

4,543,803

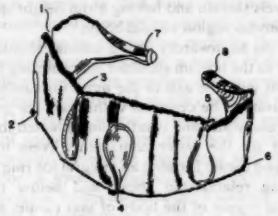
LIGHTWEIGHT, RIGID, METAL PRODUCT AND PROCESS FOR PRODUCING SAME

Mark Keyasko, 228 Hilton Ave., Maplewood, N.J. 07040

Filed Nov. 30, 1983, Ser. No. 556,301
Int. Cl.[4] A44C *25/00;* **B44C** *1/04*
U.S. Cl. 63—2 **28 Claims**

1. A process for preparing a lightweight, rigid, metal product in a desired shape, said proces comprising the steps of providing an electrically conductive wire metal mesh having a plurality of woven wire strands defining voids therebetween; forming said electrically conductive wire metal mesh into a desired nonplanar three-dimensional shape; and electroplating a metal onto the surfaces of said wire strands of said wire metal mesh so as to completely fill the voids of said wire metal mesh

to provide a metal rigid structure for the product in said desired nonplanar three-dimensional shape.



13. A process according to claim 1, wherein said wire metal mesh has a mesh size of from 10×10 to 400×2,800.

4,543,804

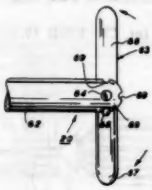
PIERCED EARRING LOCKING AND HOLDING SYSTEM

Frank J. Cappiello, Richter Dr., Danbury, Conn. 06810

Continuation of Ser. No. 926,946, Jul. 20, 1978,. This application Apr. 1, 1980, Ser. No. 136,361

Int. Cl.⁴ A44C *7/00*

U.S. Cl. 63—12 **7 Claims**



1. A one-piece, integral, locking and holding system for pierced earrings comprising:

(A) a shaft having

(a) a distal end, and

(b) a proximal end mounted to the decorative viewable portion of the earring;

(B) a locking bar pivotally engaged by pivot means with the distal end of the shaft near one end of the bar and

(a) movable from a first position with the longitudinal axis of the locking bar substantially parallel to the central axis of the shaft, to

(b) a second position with the longitudinal axis of the locking bar substantially perpendicular to the central axis of the shaft, and

(c) comprising two independent sections, each of which are individually pivotable about the axis defined by pivot means through an arc of at least 180°, allowing each of the sections to be moved in opposite directions, to provide a substantially continuous locking bar having a longitudinal axis perpendicular to the central axis of the shaft with said bar extending in opposite directions from the shaft; and

(C) pivot means integrally connecting the shaft and the locking bar, and providing the axis about which the locking bar pivots,

whereby, a one-piece, integral, locking and holding system is achieved which is easily insertable in a pierced ear as a substantially straight member, and is quickly moved into a secure, locked position, eliminating unwanted dislodgement from the ear by easily moving the locking bar sections in opposite directions.

4,543,805

METHOD OF ATTACHING A SEPARABLE SLIDE FASTENER TO KNIT FABRICS

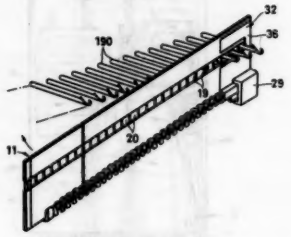
Hiroshi Yoshida, Kurobe; Yoshio Matsuda, Toyama, and Shunji Akashi, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Division of Ser. No. 258,647, Apr. 29, 1981,. This application Sep. 21, 1982, Ser. No. 420,893

Claims priority, application Japan, Jul. 12, 1980, 55-95240

Int. Cl.⁴ D04B *9/40*

U.S. Cl. 66—148 **7 Claims**



1. A method of attaching a slide fastener stringer to a knit fabric, comprising the steps of:

(a) providing a slide fastener stringer having two tape webs spaced from each other and interconnected by a plurality of longitudinally spaced transverse thread portions;

(b) looping said transverse thread portions with a row of loops which constitute a course of a knit fabric; and

(c) thereafter, knitting said knit fabric so as to form successive courses.

4,543,806

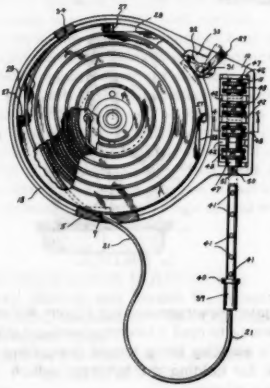
RETRACTABLE CABLE LOCK

James J. Papandrea, 10202 W. Hayes, West Allis, Wis. 53227, and John L. Wenger, Milwaukee, Wis., assignors to James J. Papandrea, West Allis, Wis.

Filed Jul. 18, 1983, Ser. No. 515,016

Int. Cl.⁴ E05B *37/06*

U.S. Cl. 70—30 **1 Claim**



1. A portable, hand-holdable, retractable cable lock, comprising:

a casing that defines an annular chamber, said casing includes a pair of annular cup-shaped cap members each having a base plate and a circumferential rim projecting

from one side thereof, one of said rims including an annular shoulder for receiving said other rim in interfitting engagement therewith, one of said cap members further including a circular boss projecting from said one side into said chamber, said boss includes a threaded stud of lesser diameter than said boss projecting coaxially therefrom;

a spool disposed in said chamber within said casing, said spool including a cylindrical core and a pair of opposing spaced apart annular retaining plates thereon, said core receives said boss therein to provide free rotational movement of said spool relative to said casing, and includes a coaxial cylindrical portion projecting from one of said retaining plates;

an extendable cable wound on said spool having one end attached to said core and its other end extending through the rim of one of said cap members;

latch means for permitting free rotation of said spool in one direction to extend said cable and for preventing free rotation of said spool in its other direction to rewind said cable, said latch means includes:

an annular ratchet wheel disposed within said casing coaxially with said spool, said ratchet wheel attached to said core for rotation therewith,

a pawl member pivotally mounted on said casing having one end extending within said casing to engage said ratchet wheel and its other end extending outside of said casing, and

a ratchet spring for normally biasing said one end of said pawl into engagement with said ratchet wheel;

first and second friction-reducing annular thin discs disposed coaxially with said spool in said chamber within said casing, said first disc located between said spool and said one cap member and mounted for free rotation on said boss, and said second disc located between said ratchet wheel and said other cap member and mounted for free rotation on said projecting cylindrical portion of said core;

case securing means threadedly engageable with said stud to bear against said other cap member and securely hold said cap members together;

locking means for locking said other end of said cable to said casing, said locking means includes tumbler means within said casing, and an elongate member attached to and extending coaxially from said other end of said cable having a plurality of aligned spaced apart lugs thereon projecting transversely to the longitudinal axis of said elongate member, said lugs adapted to cooperate with said tumbler means for locking said elongate member in the casing;

a coil spring disposed in said chamber within said casing between said second disc and said other cap member, said coil spring having one end attached to said projecting cylindrical portion of said core and its other end attached to said casing so that when said cable is unlocked and in an extended position said coil spring rotates said spool to rewind said cable thereon upon disengagement of said pawl from said ratchet wheel; and

an annular separator plate disposed in said chamber within said casing coaxially with said spool and located between said second disc and said coil spring, and mounted for free rotation on said projecting portion of said core.

4,543,807

PLUNGER OPERATED LOCK

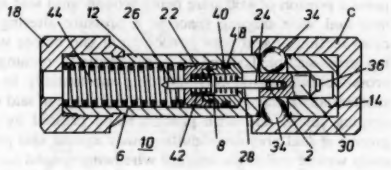
James A. Swisher, Box 248, Southport, Conn. 06490

Filed May 2, 1983, Ser. No. 490,458

Int. Cl.[4] E05B *67/36*

U.S. Cl. 70—34 **6 Claims**

1. A lock of the plunger operated type which includes a housing with an elongated aperture opening to the rear of the housing and a lock operating plunger assembly axially movable in the housing between a forward locking position and a rear unlocking position, in which the plunger assembly comprises a shaft carrying a forward locking member and a rear locking member positioning portion which are normally biased apart so that the plunger assembly normally has a predetermined overall length which is too great to permit the plunger assembly to move far enough rearwardly to allow the forward locking member to reach an unlocking position, and means projecting rearwardly from the locking member into position for grasping by an operating tool to draw the locking member rearwardly, and means responsive to the drawing of the locking member rearwardly by the operating tool to cause said locking member and said positioning portion to move together in relation to each other whereby the overall length thereof is shortened an amount that will allow the locking portion to reach the unlocking position, in which the means projecting



rearwardly from the locking member comprises a shaft extending through the rear positioning portion and projects rearwardly therefrom, in which the rear positioning portion comprises a shaft housing and said shaft has a stop member disposed thereon in the shaft housing, and biasing means is provided in the shaft housing on both sides of the stop member to maintain said stop member in a medial position in the shaft housing so that said forward locking member and the shaft housing are maintained in a position so as to have said overall length, whereby forward movement of said shaft causes said overall length to increase and rearward movement causes said overall length between the forward end of the forward locking member and the rear end of the housing to decrease.

4,543,808

APPARATUS FOR WINDING WIRE ON A SPOOL

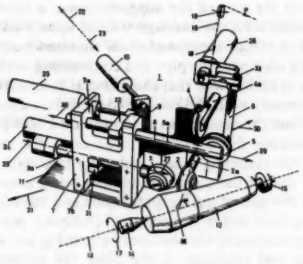
Rolf Nilsson; Hakan Björnfoth, both of Karlskoga, Sweden, and Knut Slungaard, deceased, late of Karlskoga, Sweden by Kerstin Aberg, Guje Slungaard, legal representatives, assignors to AB Bofors, Bofors, Sweden

Filed Jan. 20, 1984, Ser. No. 572,490

Claims priority, application Sweden, Jan. 20, 1983, 8300269

Int. Cl.[4] B21F *3/04, 21/00*

U.S. Cl. 72—137 **13 Claims**



1. An apparatus for winding a wire onto a spool, said wire being elastic in its radial direction and having a cross-sectional shape other than substantially rectangular before said winding, said apparatus comprising:

rotation means for rotating said spool about a longitudinal axis and for causing said wire to wind on said spool during said rotation thereof;

at least one pressure roller mounted for reciprocal movement relative to the longitudinal axis of said spool and for rotation about an axis transverse to the direction of said reciprocal movement;

a peripheral groove in an outer face of said roller for interacting with a previously wound coil of a layer of wire being wound on said spool and with an underlying surface of said spool or a previously wound layer of said wire so as to provide a wire shaping space having a substantially rectangular cross-sectional shape, said peripheral groove having a bottom line defining an imaginary plane intersecting the longitudinal axis of said spool at an acute angle; and,

pressing means for causing said at least one pressure roller to press a portion of said wire being wound onto said spool into said wire shaping space at a pressure altering the cross-section of said wire portion from said before winding cross-sectional shape to a substantially rectangular cross-sectional shape corresponding substantially to said substantially rectangular cross-sectional shape of said wire shaping space, said wire portion being pressed by said groove at said pressure simultaneously against said previously wound coil of the layer of wire being wound on said spool and against said underlying surface of said spool or said previously wound layer of said wire so as to provide tight coils of said wire without significant space between adjacent coils.

4,543,809

APPARATUS FOR BENDING THIN-WALLED PIPES

Thomas P. Lang, Erbacher Strasse 45, 6120 Michelstadt, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 510,391

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 8219048[U]

Int. Cl.⁴ B21D *7/04, 9/05*

U.S. Cl. 72—150 **7 Claims**

1. An apparatus for bending a thin-walled pipe, comprising a support frame having an axis; a mandrel carriage movable with respect to the axis of the support frame; a bending mandrel cooperating with the carriage so that upon movement of the mandrel carriage the mandrel is simultaneously co-moved; means for clamping the pipe and cooperating with the mandrel carriage in such a way that the mandrel is selectively movable simultaneously with and relative to the pipe; means for bending the pipe and the mandrel so as to provide a bent pipe piece and for separating the bent pipe piece once the mandrel is retracted; the clamping means including two clamping devices, the first one of the clamping devices being movable with respect to the axis of the support frame and having a stationary clamping jaw and a cooperating clamping jaw movable in direction relative to the stationary clamping jaw so as to allow clamping and releasing of the pipe; the second one of the clamping devices being stationary and having a fixed clamping jaw and a cooperating clamping jaw movable relative to the stationary clamping jaw so as to allow clamping and releasing of the pipe; and further comprising at least one spring having one end abutting the first clamping device, and another end resting against the mandrel carriage so as to provide the cooperating movement between the first clamping device and the mandrel carriage.

4,543,810

SIX-HIGH ROLLING STAND

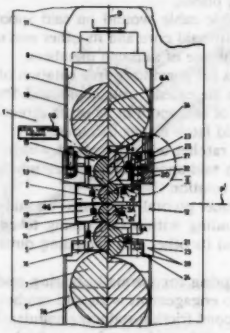
Erich Stoy, Ratingen, and Hans Römmen, Dormagen, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 352,520, Feb. 26, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,371

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107693; Jun. 4, 1981, 3122128

Int. Cl.⁴ B21B *13/14*

U.S. Cl. 72—245 **5 Claims**



1. In a six-high roll stand of the kind having a frame, two working rolls (2, 3), two intermediate rolls (4, 5) and two outer back-up rolls (6, 7), wherein at least the outer back-up rolls (6, 7) and the intermediate rolls (4, 5) are located one above the other essentially in the same vertical plane, wherein the intermediate rolls (4, 5) are arranged so as to be axially displaceable between the outer back-up rolls (6, 7) and the working rolls (2, 3) and wherein blocks (12), secured to said frame, have vertical guide surfaces for journal chocks (13, 14) of the working rolls (2, 3) and vertical guide surfaces for journal chocks (15, 16) of the intermediate rolls (4, 5), and wherein, moreover, adjusting means (22) are provided for the balancing and bending of the intermediate rolls (4, 5), which adjusting means (22) are adapted to act on said journal chocks (15, 16) of the intermediate rolls (4, 5) with their operating force being directed against the outer back-up rolls (6, 7) and wherein said adjusting means (22) for effecting bending of the intermediate rolls (4, 5) are displaced in a horizontal direction parallel to the roll axes,

the improvement which comprises that

(a) said adjusting means (22) for bending the intermediate rolls (4, 5) are seated in said blocks (12) secured to said frame;

(b) at each of said blocks (12) is arranged a lower (20) and an upper (19) guide piece displaceable in vertical direction, each of said guide pieces (19, 20) being provided with guide surfaces for guiding the respective journal chocks (15 and 16) of the intermediate rolls (4 and 5);

(c) said journal chocks (15, 16) are capable of displacement in a horizontal direction relative to the operational position of the adjusting means (22) and/or the operational position of the adjusting means (22) is varied in its horizontal direction (20', 22') within the guide pieces (19, 20);

(d) each guide piece (19, 20) has a part (23) on the frame and a part (24) associated with the respective journal chock (15, 16) of the intermediate rolls (4, 5);

(e) the two said parts (23, 24) of the guide pieces (19, 20) are displaceable relative to each other exclusively in vertical direction;

(f) between said parts (23, 24) two adjusting means (22, 22', 22''), spaced one behind the other, engage as a bending device in axial direction of the intermediate rolls (4, 5);

(g) said journal chocks (15, 16) of the intermediate rolls (4, 5) are arranged so as to be exclusively displaceable horizon-

tally (21; FIGS. 1 to 3) relative to the associated parts (24) of the guide pieces (19, 20); and

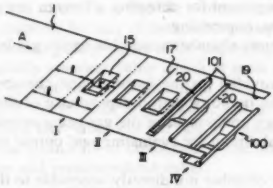
(h) the two adjusting means (22, 22', 22'') which are spaced one behind each other are variable with respect to their displacement forces in dependence on the respective axial position of the journal chocks (15, 16) of the intermediate rolls.

4,543,811

PROGRESSIVE FORMING METHOD OF PRODUCT HAVING VARIED CROSS-SECTIONAL LENGTH

Yasuaki Aoyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 17, 1983, Ser. No. 476,339
Claims priority, application Japan, Sep. 14, 1982, 57-158748
Int. Cl.[4] B21D *24/16*
U.S. Cl. 72—332 **9 Claims**



1. A method for producing, from a continuous strip of plastically deformable material, a plurality of products in the form of substantially U-shaped cross section channel members, each product having a varied cross-sectional length in a direction of supply of the strip of the material, said method comprising the steps of:

intermittently supplying the strip of material along a plurality of processing zones spaced from each other in the direction of the supply of the material, and

successively subjecting the material in successive zones to various processing steps between successive supplying steps, which processing steps at least include drawing, slitting, forming, and cutting, for obtaining from the material products having a varied cross-sectional length in the direction of supply of the material, wherein the improvement comprises:

first drawing the material in such a manner that each portion of the material corresponding to a portion of the product having a cross-sectional length greater than the minimum cross-sectional length of the product is shaped by plastically elongating the portion of the material by an amount corresponding to a difference of the cross-sectional length of said portion of the product from the minimum cross-sectional length of the product;

after all drawing steps, slitting the material to form a slit which extends transversely to the direction of the supply of the material; and

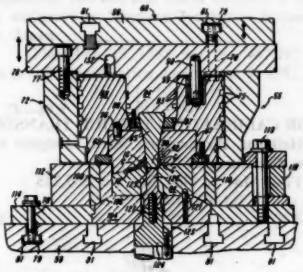
finally, cutting the material along lines parallel to the direction of supply of the material, to separate the obtained product from the remainder of the strip of the material, wherein the edges produced by said slitting transverse to the direction of the supply of the material are the total final edges of the product in the form of a U-shaped section channel member in said transverse direction, thereby attaining a scrap-less process in the direction of supply of the material.

4,543,812

FORGING APPARATUS

Donald L. Theobald, Kettering, Ohio, assignor to The Harris-Thomas Drop Forge Company, Dayton, Ohio

Division of Ser. No. 352,191, Feb. 25, 1982, Pat. No. 4,463,570.
This application Aug. 6, 1984, Ser. No. 638,250
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—354 **10 Claims**



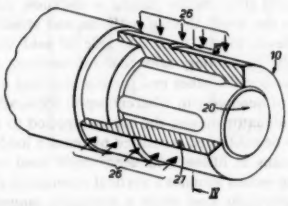
1. Forging apparatus adapted to be mounted on a press having a ram movable relative to a bolster plate and for producing a forged metal part such as a ball joint socket, said apparatus comprising a die set assembly including a first annular die member and a mating second die member, said first die member being movable with said ram between a retracted position and a closed position relative to said second die member, said die members cooperating in said closed position to define a cavity corresponding in configuration with the desired external shape of the part, a hydraulic cylinder including a movable annular piston, means for rigidly securing said cylinder to said ram, said cylinder including a center hub portion movable with said ram and projecting into said annular piston, means for rigidly and removably securing said first annular die member to said annular piston, a punch removably mounted on said hub portion of said cylinder and projecting through said first annular die member to said cavity, support means rigidly securing said second die member to said bolster plate, and means for supplying hydraulic fluid to said cylinder for extending said piston and said first die member relative to said punch and providing for retraction of said piston and said first die member under substantial hydraulic pressure in response to continued movement of said punch with said ram after said die members move to said closed position.

4,543,813

METHOD OF MAKING VALVE SLEEVES

Peter R. Rogers, Chepstow, Wales, assignor to TRW Cam Gears Limited, Avon, England

Filed Sep. 19, 1983, Ser. No. 533,638
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—356 **5 Claims**



1. A method of forming a one piece valve sleeve for a rotary

valve, comprising forming a tube having a generally annular portion defining a restricted aperture at one end, swaging the tube on a mandrel to form axially extending grooves having accurately formed lips in the inner surface of a tube so that one end of each groove is stopped by the annular portion and deforming the tube to stop the other ends of the grooves, the portion of the tube which is deformed to close the other ends of the grooves being initially thicker than the central section of the tube.

4,543,814

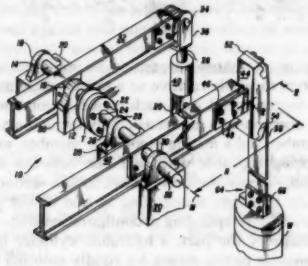
DEVICE FOR CALIBRATING TORQUE TRANSDUCERS

Gregory P. Heilman, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 9, 1984, Ser. No. 589,245

Int. Cl.[4] G01L *25/00*

U.S. Cl. 73—1 C **8 Claims**



1. A device for calibrating torque transducers comprising;

(a) base means;

(b) input lever means mounted on said base means for pivotal movement about a torque axis;

(c) load lever means mounted on said base means for pivotal movement about said torque axis and spaced from said first lever means;

(d) input shaft means connected to said input lever means and adapted for connection to one end of a transducer to be calibrated;

(e) load shaft means connected to said load lever means and adapted for connection to the opposite end of said transducer;

(f) actuator means operatively connected to apply a load to said input lever means for applying a torque about said axis to said one end of said transducer;

(g) block means attached to said output lever means and defining a curved loading surface having a substantially constant radius of curvature equal to the distance of said surface from said axis;

(h) elongated strap means having a thickness substantially less than the width thereof with one end attached to said output lever means with one side of said strap means moveably contacting said loading surface, said strap means having the other end thereof attached to a desired amount of deadweight, wherein, upon application of load by said actuator means, the torque applied to said transducer to be calibrated is resisted by tension loading of said strap means in lifting said deadweight load whereupon said strap means assumes a vertical orientation and applies said deadweight load about a moveable tangential point on said surface as said load lever means is pivoted about said torque axis, said moveable point being maintained at a constant radius from said torque axis.

4,543,815

DEVICE FOR THE DETECTION OF FOREIGN COMPONENTS IN A GAS AND AN APPLICATION OF THE DEVICE

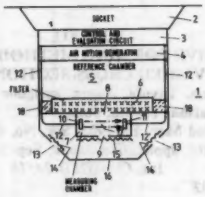
Alan Troup, Männedorf; Sigfrid Strässler, Baden-Dättwil; Hannes Güttinger, Stäfa, and Gustav Pfister, Uetikon, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Jun. 26, 1984, Ser. No. 624,910

Claims priority, application Switzerland, Jul. 15, 1983, 3900/83; Oct. 3, 1983, 5367/83

Int. Cl.[4] G01N *15/00*

U.S. Cl. 73—28 **40 Claims**



1. An arrangement for detecting a foreign component contained in a gas, comprising:

a measurement chamber accessible to the gas being investigated;

a sensor provided for the measurement chamber for transmitting an output signal in dependence of the content of the foreign component of the gas being investigated;

an electrical circuit for evaluating said output signal of said sensor;

a reference chamber not directly accessible to the gas being investigated;

a reference gas contained in said reference chamber and having a lower foreign component content than the gas being investigated;

means defining at least one aperture for providing intercommunication between the reference chamber and said measurement chamber;

the reference chamber comprising an air motion generator for periodically and alternatingly forcing said reference gas out of the reference chamber into the measurement chamber and for withdrawing the reference gas at least partially back into the reference chamber;

the reference gas at least partially displacing the gas being investigated in the measurement chamber when forced thereinto;

the gas being investigated entering the measurement chamber when the reference gas is withdrawn into the reference chamber; and

said electrical circuit evaluating a modulated component of the output signal of the sensor as a criterion for the foreign component content of the gas being investigated.

4,543,816

METHOD AND APPARATUS FOR MONITORING THE DIAMETERS OF ROD-SHAPED PRODUCTS OF THE TOBACCO PROCESSING INDUSTRY

Peter Brand, Hamburg; Heinz-Christen Lorenzen, Wentorf; Uwe Heitmann, and Peter Menzel, both of Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. K.G., Hamburg, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,458

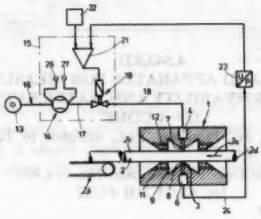
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315866; Sep. 3, 1983, 3331902

Int. Cl.[4] G01B *13/08*

U.S. Cl. 73—37.6 **28 Claims**

1. A method of monitoring the diameter of a rod-shaped product of the tobacco processing industry which is deformable by the impinging gaseous fluid when the pressure of such

fluid exceeds a given value, particularly a filter rod having a porous tubular wrapper; comprising the steps of transporting the product axially along a predetermined path; establishing between the exterior of the product in a portion of said path and the atmosphere at least one passage of predetermined cross-sectional area so that the unoccupied portion of such passage varies with deviations of the diameter of the product portion in the passage from a predetermined value; directing against the exterior of the moving product a stream of gaseous



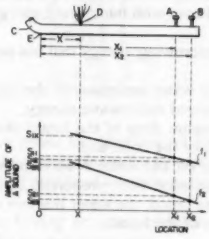
testing fluid so that the fluid impinges upon the product; confining such fluid to the flow into the atmosphere at least substantially exclusively by way of the unoccupied portion of the passage; maintaining the pressure of the impinging fluid at an at least substantially constant value which at most matches said given value so that the impinging fluid does not effect any deformation of the product in said path; and generating first signals denoting fluctuations of the rate of fluid flow through said passage as a function of deviations of the diameter of the product from said predetermined value.

4,543,817

METHOD OF DETECTING A LEAKAGE OF FLUID

Sakae Sugiyama, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 480,787
Claims priority, application Japan, Mar. 31, 1982, 57-50998
Int. Cl.⁴ G01M *3/24*
U.S. Cl. 73—40.5 A **8 Claims**



1. A method of detecting a leakage of fluid comprising the steps of:

detecting a leaking sound of fluid by a plurality of acoustic sensors separately mounted to a pipe through which fluid flows;

obtaining amplitudes of a plurality of different frequency components extracted from the output signals from said acoustic sensors;

determining a leaking location of fluid of said pipe on the basis of said amplitudes;

determining an amount of leaking fluid on the basis of said amplitudes; and

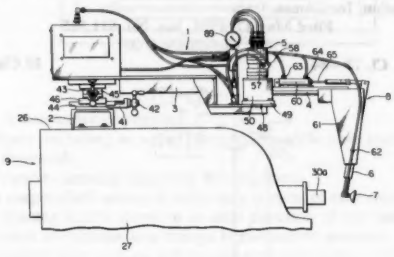
determining an opening area of a broken part of said pipe on the basis of a differential pressure between a first pressure in said pipe and a second pressure outside said pipe, and the amount of the leaking fluid.

4,543,818

SEAL CHECK APPARATUS FOR LUBRICANT-ENCLOSURE TYPE TRACK JOINTS OF TRACK CHAINS

Yasumitsu Moriki, Tokyo; Tadashi Sato, Sagamihara; Kazuyoshi Yamamoto, Ibaraki, and Izumi Takahashi, Hasuta, all of Japan, assignors to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,797
Claims priority, application Japan, Sep. 9, 1982, 57-155806
Int. Cl.⁴ G01M *3/28*
U.S. Cl. 73—49.8 **11 Claims**



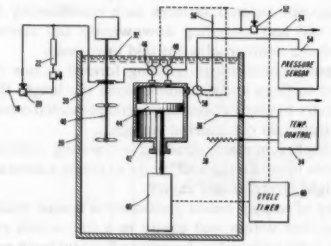
1. A seal check apparatus for a lubricant-enclosure type track joint of a track chain comprising a base assembly mounted on a track press used for assembling said track chain; a vacuum head engageable with and disengageable from said track joint; means on said base assembly supporting said vacuum head; first actuating means on said base assembly for displacing said vacuum head supporting means; second actuating means on said vacuum head supporting means for displacing said vacuum head; a pneumatic system for sucking gas from said vacuum head; and control means for controlling the operations of said first and second actuating means and said pneumatic system.

4,543,819

VAPOR-LIQUID RATIO ANALYZER

Thomas G. Chin, and Arthur Alston, both of El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 19, 1983, Ser. No. 543,446
Int. Cl.⁴ G01N *7/14*
U.S. Cl. 73—64.2 **21 Claims**



1. A method for measuring the vapor-liquid temperature of a liquid for a specified vapor-liquid ratio, comprising the steps of:

filling a chamber with a unit volume of the liquid;

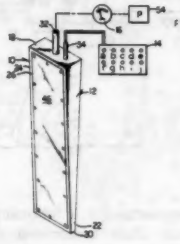
expanding the chamber to create a volume which is a predetermined fixed multiple of said unit volume, enabling some of the liquid to evaporate into the expanded volume;
maintaining the liquid and vapor at a predetermined temperature;
measuring the pressure within the chamber after vapor-liquid equilibrium is established;
determining the difference between the measured pressure and a reference pressure; and
deriving the vapor-liquid ratio temperature from the determined pressure differential.

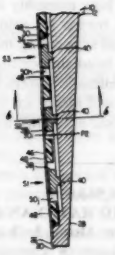
4,543,820

TAPERED BLADE IN SITU SOIL TESTING DEVICE

Richard L. Handy, Ames, Iowa, and Alan J. Lutenegger, Potsdam, N.Y., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 17, 1984, Ser. No. 611,125
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—84 **10 Claims**





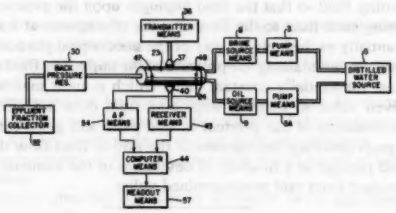
1. An in situ soil testing device comprising:
a tapered body member having an upper end, a lower end, and opposite tapered surfaces each commencing at said upper end and extending downwardly and converging toward one another adjacent said lower end;
an elongated pressure cavity being formed in one of said tapered surfaces and extending along the length thereof, said cavity having an open upper end presented outwardly away from said one tapered surface;
flexible diaphragm means attached in covering relation over said open upper end of said cavity to create a substantially fluid tight cover to said cavity;
a plurality of sensing means positioned in spaced relation to one another within said cavity in a line which extends from a point adjacent said upper end of said body member to a point adjacent said lower end of said body member, each one of said sensing means being capable of individually sensing the soil pressure exerted on said diaphragm adjacent said one sensing means when said tapered body member is buried in the soil;
indicator means connected to each of said sensing means for indicating the soil pressure sensed by said sensing means;
fluid conduit means in fluid communication with said cavity;
a fluid pressure source connected to said conduit means and adapted to introduce selected variable fluid pressures to said cavity through said conduit means;
said pressure cavity providing fluid communication to all of said pressure sensing means so that all said pressure sensing means are subjected to substantially the same fluid pressure at any one time;
gauge means for monitoring the fluid pressure within said cavity.

4,543,821

METHOD AND APPARATUS FOR MEASURING RELATIVE PERMEABILITY AND WATER SATURATION OF A CORE

Lorne A. Davis, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,499
Int. Cl.[4] E21B *49/02*
U.S. Cl. 73—153 **14 Claims**



1. A method of determining the oil and water relative permeabilities and the water saturation of a core of earthen material comprising the steps of:
providing two types of liquid, in a manner so that the two liquids mix to form a two phase liquid which moves through the core,
controlling the volume flow of each type of liquid so as to control the composition of the two phase liquid,
irradiating said core with microwave energy with the liquid in the core,
receiving the microwave energy that has passed through the core,
determining the water saturation of the core in accordance with the received microwave energy,
sensing the pressure drop of the liquid along the predetermined length of the core, and
determining the oil and water relative permeabilities of the core in accordance with properties of the core, the oil fraction of the liquid, the water fraction of the liquid, and the flow rate of the liquid.

4,543,822

ELECTROMAGNETIC SHEARFLOWMETER FOR REMOTE OCEANIC APPLICATIONS

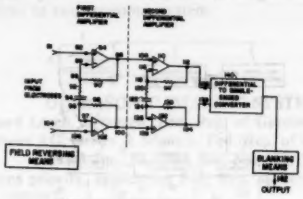
Furman Y. Sorrell, Raleigh, N.C.; Thomas B. Curtin, Arlington, Va., and Michael D. Feezor, Chapel Hill, N.C., assignors to Seametrics, Inc., Raleigh, N.C.

Filed Dec. 7, 1983, Ser. No. 559,188
Int. Cl.[4] G01P *5/08*; G01F *1/60*
U.S. Cl. 73—170 A **5 Claims**

1. An electromagnetic flowmeter, comprising:
at least one pair of electrodes
disposed about a magnetic field within a conductive fluid for receiving electric pulses responsive to relative motion of said conductive fluid,
circuit means connected to said electrodes comprising

at least one pair of operational amplifiers each connected to one of said pair of electrodes,

said operational amplifiers being isolated from ground reference,



passive electronic components adapted to amplify flow-induced signals, connected to said amplifiers,

including a single capacitor between said amplifiers for interrupting DC flow between said amplifiers.

4,543,823

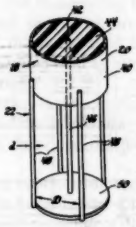
MICROWAVE PROBE FOR DETECTING OIL LEVEL

Louis L. Nagy, Warren, and Michael J. O'Rourke, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 372,470, Apr. 28, 1982, Pat. No. 4,503,384. This application Nov. 15, 1984, Ser. No. 671,600

Int. Cl.⁴ G01R *27/04*

U.S. Cl. 73—304 C **3 Claims**



1. A microwave probe for detecting oil level in the crankcase of an internal combustion engine by measuring the dielectric constant of fluid at a fixed location in the crankcase comprising:

a coaxial cable having an outer conductive sheath and a concentrically located inner wire;

a cage-like tip attached to an end of the coaxial cable including a center wire connected to the said inner wire, three to five outer wires each connected at one end to the sheath and surrounding the center wire, the outer wires being spaced sufficiently to facilitate free flow of fluid through the tip and being sufficiently close to contain a microwave field within the tip, and means shorting the distal ends of the said center wire and outer wires the wire geometry and number of wires being so selected that the impedance of the tip, when immersed in the oil, substantially matches the impedance of the coaxial cable, whereby the dielectric constant of the fluid in the tip has one value when the tip is immersed in oil and a substantially different value when the tip is, at most, partially immersed in oil so that a low oil level is readily detected.

4,543,824

BAROMETER

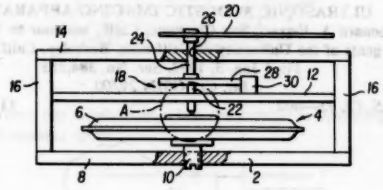
Karl Marterer, Wertheim-Waldenhausen, Fed. Rep. of Germany, assignor to Dostmann GmbH & Co. KG, Wertheim-Reicholzheim, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,231

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315093

Int. Cl.⁴ G01L *7/12*

U.S. Cl. 73—386 **1 Claim**



1. A barometer comprising:

a frame including an upper plate and a middle plate parallel therewith;

a vacuum housing supported by said frame;

an output shaft resting directly on a portion of said vacuum housing which moves in an axial direction of said output shaft in response to a change in barometric pressure;

a pointer shaft unitary and coaxial with said output shaft;

an exterior threaded portion having exterior helical trapezoidal threads on said output shaft;

an interior threaded portion having interior trapezoidal threads on said middle plate, said interior threads engaging said exterior threads to permit rotation and axial movement of said output shaft relative to said frame;

a bearing in said upper plate for supporting said pointer shaft for rotational and axial movement; and

return spring means operatively associated with said output shaft for biasing said output shaft in a rotational position such that said output shaft remains in engagement with said housing as barometric pressure changes.

4,543,825

PROCEDURE FOR BALANCING OF ROTORS WITHOUT JOURNALS

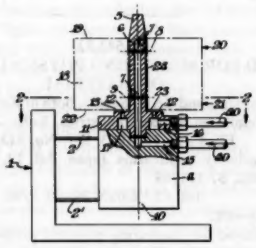
Harald Schönfeld, Darmstadt, and Angelo Bauer, Rossdorf, both of Fed. Rep. of Germany, assignors to Carl Schenck A.G., Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,419

Claims priority, application European Pat. Off., Sep. 25, 1982, 82108883.8

Int. Cl.⁴ G01M *1/16*

U.S. Cl. 73—459 **2 Claims**



1. A procedure for balancing rotating bodies (rotors without

journals) comprising the steps of mounting the body to be balanced directly onto a non-rotating arbor, directing fluid under pressure between the outside surface of the arbor and inside surface of the body to thereby separate the body from the arbor, rotating the body relative to the arbor, and determining the position and magnitude of the body unbalance by measuring vibration of the non-rotating arbor resulting from unbalance of the rotating body.

4,543,826

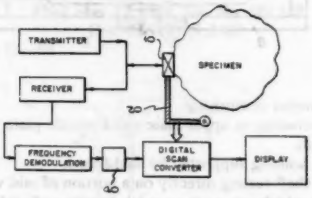
ULTRASONIC ACOUSTIC IMAGING APPARATUS

Leonard A. Ferrari, San Clemente, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 3, 1982, Ser. No. 384,553

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—602 **11 Claims**



1. A system for generating an electrical signal having instantaneous frequency deviations corresponding to the scattering properties of a media supporting acoustic pulse propogation against which said signal is electrically projected, comprising:

transmitter means for generating a signal at a defined frequency;

transducer means, coupled to said transmitter means, for transforming said electrical signal into an ultrasonic acoustic pressure signal, for projecting said acoustic pressure signal against said media, and for receiving acoustic pressure signals reflected from said media in response to said projected acoustic pressure signal;

receiver means, coupled to said transducer means, for transforming said reflected acoustic pressure signal into an electrical signal;

frequency demodulation means, coupled to said receiver means, for frequency demodulating said electrical signal of said receiver means to produce a frequency demodulation signal containing instantaneous frequency deviations from said defined frequency responsive to the scattering properties of said media from stationary and moving structures therein; and

display means, coupled to the output of said frequency demodulation means, said display means being adapted for display of a cross-sectional image of said media representative of the instantaneous frequency deviation characteristics of both stationary and moving structures in said media.

4,543,827

METHOD FOR MEASURING PHYSICAL PROPERTIES OF MATERIAL

Ichiro Tominaga, and Teruo Sasaki, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Kobe, Japan

Filed Jul. 12, 1983, Ser. No. 513,082

Claims priority, application Japan, Jul. 12, 1982, 57-121757; Jul. 12, 1982, 57-121758

Int. Cl.[4] G01N *29/00, 3/40*

U.S. Cl. 73—602 **4 Claims**

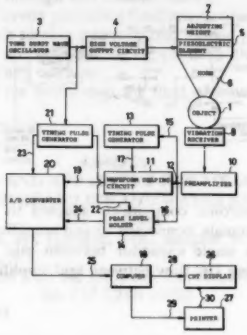
1. A method for measuring physical properties of material which comprises the steps of

producing a tone burst wave by a tone burst wave oscillator,

radiating acoustic energy of said tone burst wave onto an object to be measured to cause vibrations therein,

detecting said vibrations as a waveform of an alternating wave at a vibration receiver, and

obtaining a gradient of a line which connects peaks in a first transitional region of said waveform corresponding to a



first region where an amplitude of successive waves in the received waveforms is increasing to determine energy transfer characteristic of said object which is a ratio of a quantity of output energy to a quantity of input energy.

4,543,828

ULTRASONIC IMAGING SYSTEM

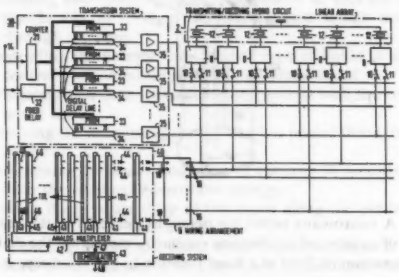
Reinhard Lerch, Erlangen, Fed. Rep. of Germany, assignor to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,724

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301981

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—626 **10 Claims**



1. In an ultrasonic imaging system with a linear array having several transducer elements of which a respective group of commonly controlled transducer elements forms a beam aperture and to which one transmitting system and one receiving system are allocated and which are equipped with an electronic focusing of the sound field by phase delay and with parallel scan of the sound field by electronic advancement, the improvement wherein:

(a) said transmitting system comprises for said transducer elements of said beam aperture respectively one digitally programmable delay line, one PROM and one transmitting amplifier;

(b) said receiving system comprises for each of said transducer elements of said beam aperture one, respective analog delay line which is equipped with n/2 taps;

(c) said imaging system comprises a common analog-multiplexer for all of said analog delay lines; and

(d) said transducer elements of said linear array are each connected to said transmitting system via a transmit switch and each of said elements is connected via a receiver switch in series with a permanent wiring arrangement to said receiving system.

4,543,829

ULTRASONIC IMAGING SYSTEM

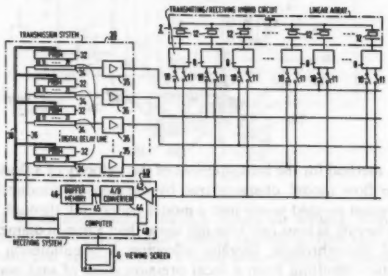
Reinhard Lerch, Erlangen, Fed. Rep. of Germany, assignor to Siemens AG, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,728

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301967

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—626 **7 Claims**



1. In an ultrasonic imaging system with a linear array having several transducer elements of which a respective group of commonly controlled transducer elements forms a beam aperture and to which one transmitting system and one receiving system are allocated and which are equipped with an electronic focusing of the sound field by phase delay and with parallel scan of the sound field by electronic advancement, the improvement wherein:

(a) said transmitting system comprises for said transducer elements of said beam aperture respectively, one digitally programmable delay line, one buffer and one transmitting amplifier;

(b) said receiving system comprises one analog-digital converter, a buffer memory and a computer;

(c) said transducer elements of said linear array are each connected to said transmitting system via a transmit switch and each of said elements is connected via a receiver switch to said receiving system; and

(d) said imaging system comprises a stepping motor which is movable perpendicularly to the electronic scan direction and perpendicularly to the sound field.

4,543,830

GAS TURBINE RUB DETECTOR

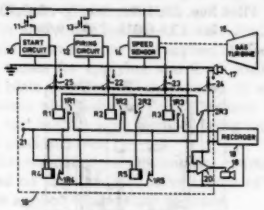
James O. Stephens, P.O. Box 1361, Niagara-on-the-Lake, Ontario, Canada L0S 1J0

Filed Dec. 9, 1983, Ser. No. 559,686

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—660 **7 Claims**

1. A gas turbine condition sensing system comprising a noise pickup device located in the air intake of a turbine, a remote transducer for reproducing the noise detected by said pickup device, coupling means for coupling said pickup device to said transducer only during selected portion of the operating cycle of said turbine, said portion of the operating cycle being selected to limit the level of the output from said transducer to a specified level wherein said coupling (device) means includes an amplifier activated only during start-up and shutdown of



the turbine but is inhibited when the turbine is operating at normal running speed.

4,543,831

OPTICAL PRESSURE TRANSDUCER

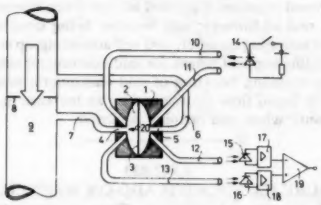
Wolfgang Meyer, Henstedt-Ulzburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,225

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206720

Int. Cl.⁴ G01L *9/00*

U.S. Cl. 73—705 **6 Claims**



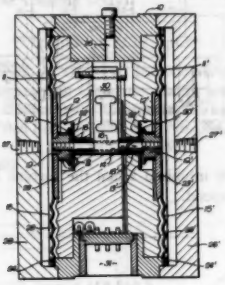
1. An optical pressure transducer comprising: a housing having a measuring space formed therein, a diaphragm mounted in the measuring space so as to be deflected by a differential pressure to be measured such that the deflection is indicative of the pressure difference, opposite sides of said diaphragm being partly reflective and partly transparent to light, a first pair of light conductors each having one end thereof optically disposed relative to one side of the diaphragm so that a light beam applied to a first light conductor thereof emerges from said one end of the first light conductor and is received at said one end of a second light conductor of the first pair after reflection from the reflective part of the diaphragm, a second pair of light conductors each having one end thereof optically disposed relative to the opposite side of the diaphragm so that a light beam applied to a first light conductor thereof emerges from said one end of the first light conductor and is received at said one end of a second light conductor of the second pair after reflection from the reflective part of the diaphragm, said light conductors being disposed so that the end of the first light conductor of one pair is situated along a prolongation of the end of the second light conductor of the other pair, and the end of the second light conductor of the one pair is situated along a prolongation of the end of the first light conductor of the other pair, all of said one ends of the light conductors being directed towards a boundary between the reflective part and the transparent part of the diaphragm, and means for applying a pressure difference across the diaphragm.

4,543,832

OVERLOAD PROTECTED PRESSURE TRANSDUCER

William E. Van Over, Glendale, Calif., assignor to Transducers, Inc., Cerritos, Calif.

Filed Sep. 30, 1983, Ser. No. 537,704
Int. Cl.[4] G01L 7/08, 9/04
U.S. Cl. 73—720 10 Claims



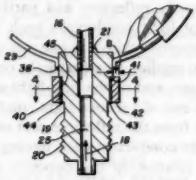
1. A pressure transducer which comprises:
(a) a housing, said housing having a cavity, said cavity being liquid filled and having an opening;
(b) a force summing member forming a portion of the wall of said cavity;
(c) means responsive to the displacement of said force summing member for creating an electrical signal; and
(d) a self-activating lip seal comprising an elastomeric seal member and a seat for closing said opening when a predetermined pressure is applied to said force summing member, said elastomeric seal member being coupled to said force summing member, said self activating lip seal further including support means for said elastomeric seal member for preventing buckling of said elastomeric seal member due to liquid flow occasioned by an increase in said fluid pressure when said opening is closed.

4,543,833

PRESSURE GAUGE WITH ADD-ON WRENCH FLATS

Walter J. Ferguson, Middlebury, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 486,147, Apr. 18, 1983, abandoned.
This application Feb. 25, 1985, Ser. No. 705,842
Int. Cl.[4] G01I 19/06
U.S. Cl. 73—741 5 Claims



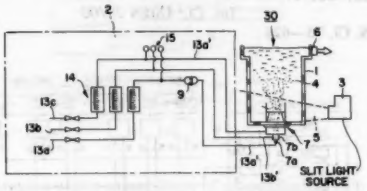
1. In a pressure gauge including a pressure sensitive element, a tubular socket assembled to said pressure sensitive element and adapted for connecting said pressure sensitive element to a source of fluid pressure and a case for housing said pressure sensitive element and including an aperture closely sized to accommodate said socket extending therethrough, wrench flats added secured against relative rotation to the peripheral surface of said socket at a location on said socket displaced from direct contact with said case so as to rotate said socket in either direction in conjunction with a directionally corresponding wrench rotation of said wrench flats, said wrench flats having a maximum dimension in the plane of said flats greater than the maximum pass through dimension of said case aperture.

4,543,834

MEASUREMENT OF VELOCITY IN WATER FLOW MODEL

Toshiaki Hasegawa, Saitama, and Yasuo Hirose, Kanagawa, both of Japan, assignors to Nippon Furnace Kogyo Kaisha, Ltd., Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 550,015
Claims priority, application Japan, Nov. 10, 1982, 57-196097
Int. Cl.[4] G01F 1/00
U.S. Cl. 73—861.05 6 Claims



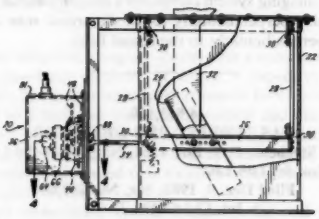
1. A method for the measurement of the velocity of a flow in a water flow model, characterized by the steps of conducting compressed aerated water into a model water tank through an orifice having at least one hole not more than 3 mm in diameter pierced therethrough, thereby allowing a phenomenon of deareation resulting from a local pressure drop of said water during the passage thereof through the orifice to induce release of a large volume of fine, uniform air bubbles into said flow and causing the portions of said flow containing a dense concentration of said fine, uniform air bubbles to give rise to a field of flow within said water tank; projecting a slit of light on said field of flow and thereby-making said flow visible in a given cross section by virtue of the irregular reflection of light on said air bubbles; and optically determining the time taken by the aggregate of said air bubbles in traversing a fixed distance.

4,543,835

DRY FLOW SENSOR WITH A LINEAR FORCE TRANSDUCER

Joseph A. Volk, Jr., Florissant, and Joseph A. Volk, Chesterfield, both of Mo., assignors to Beta II, Incorporated, St. Louis, Mo.

Filed Mar. 28, 1983, Ser. No. 479,252
Int. Cl.[4] G01F 1/30; G01L 1/08
U.S. Cl. 73—861.73 58 Claims



1. A force transducer for measuring an applied force comprising:
a surface against which the force to be measured is applied, means to drop a flow of granular material on said surface from a pre-determined height and thereby apply the force to the surface,

means to support said surface and limit its movement to a substantially linear motion,

means to generate a restoring force and apply it to the surface in opposition to said force applied thereto, means to measure the velocity of said falling granular material before it leaves the surface and produce a first signal,

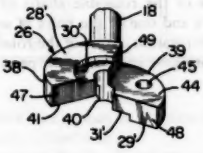
means to measure said restoring force and produce a second signal, and means to combine said first and second signals, said combined signals being thereby an indication of the flow rate of the granular material.

4,543,836

MODULAR CUP-TYPE ANEMOMETER

David B. Call, Boulder, Colo., assignor to Atmospheric Instrumentation Research, Inc., Boulder, Colo.

Filed Oct. 28, 1983, Ser. No. 546,733
Int. Cl.⁴ G01F *1/05*
U.S. Cl. 73—861.85 **14 Claims**



1. In an anemometer having means for sensing shaft speed rotation and rotatable shaft means extending from said sensing means and provided with a distal hub-connecting portion, the improvement comprising:

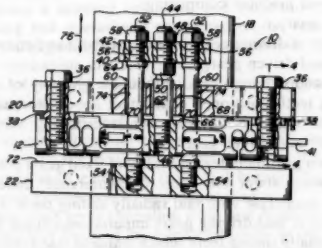
a series of circumferentially spaced, radially extending arms, a corresponding series of cup members, each said cup member disposed at an outer radial end of one of said arms, each arm terminating at its inner end in a hub sector, each said hub sector correspondingly formed to define a portion of a central hub, each said sector correspondingly including circumferentially extending, complementary offset portions, fastener means releasably interlocking said offset portions of one hub sector into overlapping relation to offset portions of next-adjacent hub sectors whereby to define said common central hub, and connecting means mounting said hub on said hub-connecting portion of said shaft means.

4,543,837

LOAD CELL TEMPERATURE COMPENSATION SYSTEM

Mark Stern; Charles Airesman, and Vijay Pandit, all of Cumberland, Md., assignors to Allegany Technology, Inc., Cumberland, Md.

Filed Apr. 25, 1984, Ser. No. 603,838
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 73—862.63 **24 Claims**



1. A load cell temperature compensation system comprising:

(a) a load cell;

(b) a load cell mounting plate member fixedly secured to a shaft member adapted to have an external force load applied thereto, said load cell being fixedly secured to said load cell mounting plate member;

(c) means for applying a force load to said load cell responsive to said external force load applied to said shaft member, said means for applying said force load including a common plate member rigidly secured to said load cell and a bottom plate member fixedly secured to said shaft member, said bottom plate member being secured to said common plate member;

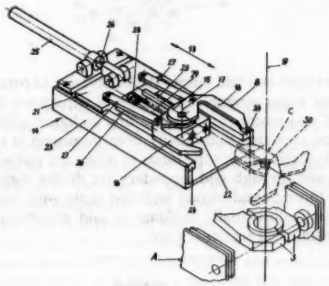
(d) means for maintaining a substantially constant reference force load on said load cell independent of temperature variations applied to said shaft member.

4,543,838

ARRANGEMENT FOR EXCHANGING MEASURING AND/OR SAMPLING PROBES

Johann Fohler, Puchenau, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 1, 1983, Ser. No. 557,355
Claims priority, application Austria, Dec. 9, 1982, 4475-82
Int. Cl.⁴ G01N *1/04*
U.S. Cl. 73—864.31 **3 Claims**



1. In an arrangement for exchanging measuring and/or sampling probes, in which said probes are slippable on and removable from a holding means on the lower end of a lance, said arrangement including a grab adapted to clamp said probes and movable between an operation position below said lance and a position laterally displaced therefrom, centering means arranged above said grab for aligning said lance with said grab, said centering means comprising

a pair of catch arms adapted to engage and constrain movement of said holding means, and

means for moving said pair of catch arms from a resting position laterally displaced from said holding means to a catch position in which said catch arms engage and maintain said holding means in alignment with and above said grab when said grab is in the operation position.

4,543,839

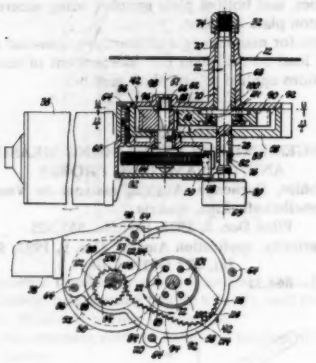
WINDSHIELD WIPER TRANSMISSION

Harry C. Buchanan, Jr., Spring Valley; William R. Mack, Kettering, and Jagmohan K. Malhotra, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1984, Ser. No. 570,996
Int. Cl.⁴ F16H *21/44, 55/17*
U.S. Cl. 74—98 **3 Claims**

1. In a windshield wiper transmission between a wiper assembly pivotable through a wiping arc having an outer wipe limit and an inner wipe limit and through a secondary arc between said inner wipe limit and a parked position and a constant speed constant torque electric motor rotatable in opposite directions through a first included angle correspond-

ing to said wiping arc and through a second included angle corresponding to said secondary arc, the combination comprising, an output shaft rotatable as a unit with said wiper assembly about a first axis of said transmission, a support shaft rotatable about a second axis of said transmission, fixed gear ratio gear means between said motor and said support shaft operative to rotate the latter in directions and through included angles corresponding to the direction of rotation and included angles of said motor, and variable gear ratio gear means between said



support shaft and said output shaft operative to rotate the latter and said wiper assembly through said wiping arc during rotation of said motor through said first included angle with said gear ratio varying sinusoidally from maximum at each of said inner and said outer wipe limits to minimum midway therebetween and through said secondary arc during rotation of said motor through said second included angle with said gear ratio remaining substantially constant at said maximum gear ratio throughout said secondary arc.

4,543,840

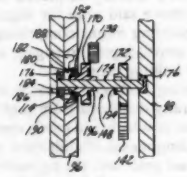
TRANSMISSION APPARATUS

Jerrold F. Maxwell, 4304 Cedarwood, Matteson, Ill. 60443

Filed Sep. 27, 1982, Ser. No. 424,362

Int. Cl.[4] F16H *3/22, 3/08;* **F16D** *21/04, 11/04*

U.S. Cl. 74—342 **6 Claims**



1. A transmission comprising:

first and second primary gears, each mounted on a rotatable shaft, the rotatable shafts having offset axes of rotation;

a plurality of pairs of secondary gears, each pair of secondary gears including first and second secondary gears coaxially disposed for rotation about a common axis, the first secondary gear of each pair of secondary gears being adapted to engage the first primary gear and the second secondary gear of each pair of secondary gears being adapted to engage the second primary gear, each pair of secondary gears providing a distinct gear ratio when coupled to the first and second primary gears;

means for coupling the first and second secondary gears of one of the pairs of secondary gears into rotational engagement with each other and with the first and second primary gears, the coupling means comprising:

one of the first and second secondary gears of each pair of secondary gears being fixedly mounted on the rotatable shaft in engagement with one of the first and second primary gears;

the other of the first and second secondary gears of each pair of secondary gears being slidingly disposed about the rotatable shaft;

the first and second secondary gears of each pair of secondary gears being formed with complimentary means for interlocking the first and second secondary gears together for simultaneous rotation; and

means acting directly on the other of the first and second secondary gears for moving the other of the first and second secondary gears along the rotatable shaft into and out of engagement with the one secondary gear of the pair of secondary gears and the primary gear associated with the slidingly disposed secondary gear; and wherein

rotation of one of the rotatable shafts of one of the first primary gears and one of the pairs of secondary gears is transmitted to rotation of one of the rotatable shafts of the second primary gear and one of the pairs of the secondary gears.

4,543,841

POWER MACHINE

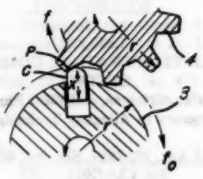
Cho H. Ju, 361-40, Sang Do Dong, Dong Juck Ku, Seoul, D.P.R. of Korea

Filed Feb. 17, 1982, Ser. No. 349,463

Claims priority, application D.P.R. of Korea, Feb. 17, 1981, 1981-481

Int. Cl.[4] F16H *55/14, 57/00, 1/12;* **F16D** *23/10*

U.S. Cl. 74—461 **4 Claims**



1. A power machine comprising:

a driven gear;

a plurality of driving gears positioned about and cooperating with said driven gear;

each of said driving gears including a plurality of radially sliding teeth positioned equidistant about the circumference of said driving gears for transmitting centrifugal force to said driven gear;

said driven gear includes a plurality of fixed gears positioned equidistant about the outer circumference thereof and which cooperate with said radially sliding teeth whereby rotation of said driving gears imparts centrifugal force to said radially sliding teeth which transmit said force to said drive gear upon cooperation with said fixed gears to thereby accelerate said driven gear.

4,543,842

SELECT RETURN MECHANISM IN A MANUAL TRANSMISSION FOR AUTOMOTIVE VEHICLES

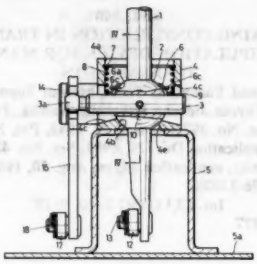
Nobuaki Katayama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1983, Ser. No. 477,400

Claims priority, application Japan, Oct. 4, 1982, 57-151073[U]

Int. Cl.⁴ B60K *20/04*; G05G *9/16*

U.S. Cl. 74—473 P **10 Claims**



1. A select return mechanism in a manual transmission for automotive vehicles comprising:

a cylindrical retainer having an upper opening and a partially spherical supporting portion formed at a lower end thereof;

a shift lever inserted into said retainer and having a spherical supporting portion formed at a lower end thereof

said supported portion being supported by said supporting portion of said retainer;

a pair of vertically elongated holes formed at opposite sides of a cylindrical wall of said retainer;

a select pin passing through a center of said supported portion at right angles to said shift lever and extending oppositely outwardly from said elongated holes;

a pushing member having a partially spherical surface fitted to an upper spherical surface of said supported portion;

a spring retaining member provided at an upper end of said retainer and surrounding said shift lever; and

a precompressed coil spring between said spring retaining member and said select pin for pressing against said select pin to bias said shift lever towards a neutral position.

4,543,843

REMOTE MASTER SHIFT CONTROL

Joseph D. Reynolds, Climax, and Ernst H. Lauer, West Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 15, 1984, Ser. No. 580,399

Int. Cl.⁴ G05G *9/18*

U.S. Cl. 74—473 R **8 Claims**

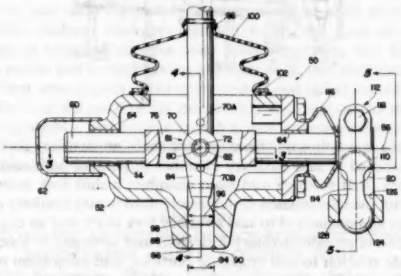
1. A remote master shift control mechanism for mechanically shifting a remotely controlled change gear transmission by applying a selected rotational and axial movement to a connecting rod operatively connected to the remotely controlled shifting mechanism of the transmission, said master control mechanism characterized by:

a control housing adapted to be mounted remote from the transmission;

a master control shaft mounted in said housing for axial movement along and rotational movement about its axis relative to the housing, at least one end of said master control shaft extending from said housing for operative driving connection to said connecting rod;

a master shift lever extending from said housing and terminating at a free end for manipulation by an operator, said master shift lever attached to said master control shaft at a clevis joint fixing said lever and said shaft for joint rotation about the axis of said control shaft and permitting pivotal movement of said control lever relative to said control shaft about a pivot axis intersection and substantially perpendicular to the axis of said control shaft, said clevis joint defined by a pivot pin received in a first bore provided in said control shaft and in a second bore provided in said master shift lever, said first and second bores being coaxial and extending substantially perpendicular to the axis of said master control shaft;

said housing defining a pair of opposed contact surfaces extending substantially parallel to said pivot axis to define a slot therebetween in which a portion of said master shift lever is received, said portion of said master shift lever received in said slot extending in the opposite direction from said pivot pin as does the portion for said shift lever



extending from said housing for manipulation by said operator and having a transverse dimension measured in the direction of the axis of said master control shaft generally equal to the width of said slot measured in the direction parallel to the axis of said control shaft whereby movement of said master shift lever in a plane containing said pivot axis will result in said portion moving through said slot and said shift lever and control shaft rotating as a unit about the axis of said control shaft and movement of said control lever in a plane containing the axis of said control shaft will result in said portion of said shift lever contacting one of said opposed surfaces to define a reaction point about which said control lever is pivotably moveable and said control shaft will move axially along its axis with said shift lever.

4,543,844

TRANSMISSION MANIPULATION DEVICE FOR MANUAL TRANSMISSION

Masaki Inui, and Yasuyoshi Yasui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Division of Ser. No. 397,442, Jul. 12, 1982, Pat. No. 4,494,419. This application Dec. 28, 1982, Ser. No. 454,013

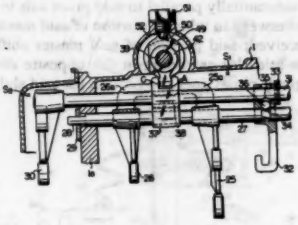
Claims priority, application Japan, Aug. 20, 1981, 56-131946; Sep. 2, 1981, 56-138838

Int. Cl.⁴ G05G *9/18, 5/10*

U.S. Cl. 74—473 R **1 Claim**

1. A transmission manipulation device for use in a manual transmission having a transmission case in which are defined a main chamber and an auxiliary chamber, a plurality of transmission clutch mechanisms mounted in the main chamber and a single transmission clutch mechanism disposed in the auxiliary chamber, said transmission manipulation device comprising: a main fork shaft axially movably mounted in said main chamber; a plurality of shift forks axially movably provided on said main fork shaft and associated with respective transmission clutch mechanisms; engaging portions provided on said shift forks and aligned in a direction perpendicular to said main fork shaft; a shift and select lever shaft rotatably and axially movably disposed in said main chamber to extend in the direc-

tion perpendicular to said main fork shaft; a projection provided on said lever shaft and engageable with said engaging portion of any one of said shift forks, said projection of said lever shaft being selectivley engageable with said engaging portion of any one of said shift forks as said lever shaft is moved axially, while rotation of said lever shaft causes movement of any one of said shift forks in the axial direction of said main fork shaft; said main fork shaft and said lever shaft being connected in such a manner that the selected shift fork is mov-



able as a unit with the main fork shaft; an auxiliary fork shaft disposed in said auxiliary chamber in parallel with said main fork shaft through said main chamber; a shift fork associated with the transmission clutch mechanism in said auxiliary chamber and connected to said auxiliary fork shaft; and an engaging portion on said auxiliary fork shaft and arranged in a side-by-side relation to said engaging portions; said projection of said lever shaft being selectively engageable with said engaging portion of said auxiliary fork shaft.

4,543,845

SHIFTING DEVICE FOR A TRANSMISSION

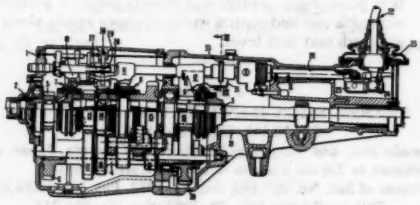
Gustav Sabel, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1982, Ser. No. 442,324

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146614

Int. Cl.[4] G05G *5/10*

U.S. Cl. 74—477 **4 Claims**



1. A gear shift mechanism for a transmission comprising:

a gear box housing;

a gear box extension connected to the gear box housing;

a gear selector shaft rotatably mounted and axially displaceable having first and second selector fingers spaced axially from one another;

shift forks slidably mounted on the gear selector shaft adapted to be selectively engaged by the first or second selector fingers and to be moved axially after such engagement as the gear-selector shaft is moved axially;

a first locking wheel fixed to the gear box housing against axial movement, cooperating with the first selector finger to prevent axial movement of at least one shift fork that is not engaged by the first selector finger; and

a second locking wheel axially adjustably fixed to the gear box extension against axial movement, cooperating with the second selector finger to prevent axial movement of a shift fork that is not engaged by the second selector finger.

4,543,846

INTERLOCKING CONSTRUCTION IN TRANSMISSION MANIPULATION DEVICE FOR MANUAL TRANSMISSION

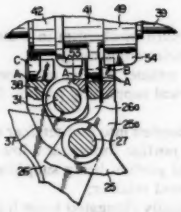
Masaki Inui, and Yasuyoshi Yasui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Division of Ser. No. 397,442, Jul. 12, 1982, Pat. No. 4,494,419. This application Dec. 28, 1982, Ser. No. 454,012

Claims priority, application Japan, Aug. 20, 1981, 56-131946; Sep. 1, 1981, 56-138082

Int. Cl.[4] G05G *5/10, 9/18*

U.S. Cl. 74—477 **3 Claims**



1. In a transmission having a transmission case, a first fork shaft and a second fork shaft axially movably and corotatably mounted on said transmission case, a plurality of shift forks axially movably and rotatably mounted on said first fork shaft, said shift forks having engaging portions aligned in a direction perpendicular to the fork shafts, a shift and select lever shaft axially movably and rotatably carried by said transmission case and extending in the direction perpendicular to said first and second fork shafts, a resilient member biasing said lever shaft towards a neutral position, a first projection provided on said lever shaft selectively engageable with the engaging portion of one of said shift forks, a first shift head fixed to said first fork shaft and having an engaging portion adjacent to said engaging portions of said shift forks, a second projection provided on said lever shaft engageable with the engaging portion of said first shift head only when said first projection is in engagement with the engaging portion of any one of said shift forks on said first fork shaft, a single shift fork fixed to said second fork shaft and having an engaging portion adjacent to said engaging portions of said shift forks attached to said first fork shaft, said first projection on said lever shaft being selectively engageable with the engaging portion of said second shift head, an interlocking construction comprising:

an interlocking plate rotatably provided on said lever shaft but prevented from rotating with respect to said case, said interlocking plate comprising front and rear projections engageable with the engaging portions of said shift forks on said first fork shaft which are not engaged by said first projection, as well as with the engaging portion of said second shift head, when said second projection is engaged by said engaging portion of said first shift head, and engageable with the engaging portions of all shift forks on said first fork shaft, as well as the engaging portion of said first shift head, when said second projection is not engaged with the first shift head.

4,543,847

BRAKE OPERATING DEVICE FOR A BICYCLE

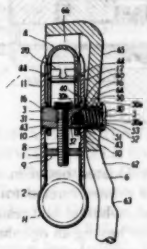
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

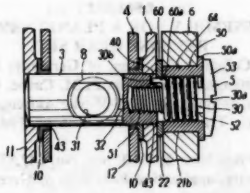
Filed Jan. 3, 1984, Ser. No. 567,657

Claims priority, application Japan, Jan. 8, 1983, 58-1206[U]

Int. Cl.[4] B62K *23/06;* B62L *3/02*

U.S. Cl. 74—480 R 7 Claims





1. A brake operating device for a bicycle comprising a bracket member having a lever shaft fixed to a handle; a main lever supported swingably to said lever shaft at said bracket member; a pivot shaft having a screw thread screwable with an axial end of said lever shaft, a stem and a head; and an auxiliary lever supported swingably to said pivot shaft; said brake operating device including a locking means for preventing said pivot shaft from loosening with respect to said lever shaft, said locking means comprising a coiled spring having a coil portion wound onto an outer periphery of said pivot shaft and a retaining end in continuation of said coil portion; and a retaining portion for receiving therein said retaining end of said coil portion; so that when said pivot shaft rotates in an unscrewing direction, said coil portion at said coiled spring contracts in diameter to impede rotation of said pivot shaft.

4,543,848

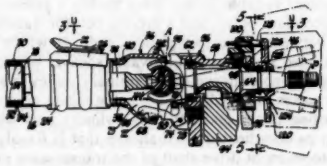
TILT STEERING COLUMN FOR VEHICLES

Howard D. Beauch, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1983, Ser. No. 564,580

Int. Cl.[4] B62D *1/18;* B60R *25/02*

U.S. Cl. 74—493 6 Claims



1. A vehicle steering column comprising a tubular steel jacket assembly adapted to be operatively mounted in a vehicle, a fixed support secured to an upper end of said tubular jacket assembly, a tilt head assembly having a central body, a steering wheel mounted on said tilt head assembly, first pivot means mounting said tilt head assembly to said tilt head support for limited tilting movement with respect to a horizontal axis of rotation, an intermediate steering shaft extending axially through said jacket assembly, an upper steering shaft forming part of said tilt head assembly terminating in connection with said steering wheel, second pivot means operatively aligned with said first pivot means operatively connecting the intermediate steering shaft to the upper steering shaft so that said shafts can be turned together for vehicle steering and so that said upper shaft can be tilted with said tilt head assembly, bearing means mounting said upper steering shaft for rotation within said tilt head assembly, releasable locking means supported on said central body for releasably connecting said tilt head assembly at selected angular positions with respect to said fixed support, said fixed support comprising a hollow shell of substantially uniform thickness stamped from steel sheet stock having an enlarged cup-like main body supporting said first pivot means and further having a tubular neck, said neck being slip fitted with respect to the upper end of said jacket assembly and fastener means directly connecting said support to said jacket assembly, and a signal switch housing assembly secured to the central body of the tilt head assembly and forming the upper end thereof.

4,543,849

AUTOMATIC ADJUSTING DEVICE FOR ACTUATING MECHANISM AND ITS CONTROL WIRE

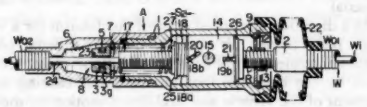
Sadashi Yamamoto, Wako; Hiroaki Kayama, Sakato, and Masaki Watanabe, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1981, Ser. No. 318,572

Claims priority, application Japan, Nov. 7, 1980, 55-157265; Nov. 7, 1980, 55-157266; Nov. 20, 1980, 55-163548; Nov. 20, 1980, 55-163549

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501.5 R 8 Claims

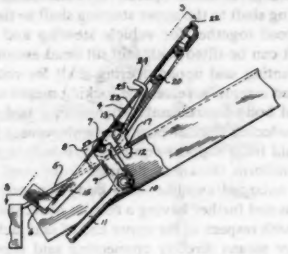


1. An automatic adjusting device for an actuating mechanism and its control wire, comprising: a control wire including an outer wire having a stationary end fixedly secured to a lever holder and a movable end, and an inner wire extending through said outer wire and having its one and other ends connected to said operating lever and said actuating mechanism, respectively; a stationary housing receiving a portion of said inner wire; a one-way feed mechanism interposed between said inner wire and said stationary housing for allowing the free movement of said inner wire toward said operating lever at all times but restricting the movement of the same in the opposite direction to a predetermined stroke corresponding to the proper ineffective stroke of said actuating mechanism; an adjust bolt being fixed relative to said stationary housing and connected to the movable end of said outer wire; an adjustor rotatably supported in said housing and axially movable relative thereto within a predetermined stroke, said adjustor being threaded on said adjust bolt; spring means resiliently urging said adjustor in a tensile direction of said inner wire; and a one-way rotating mechanism mounted in said stationary housing for unidirectionally rotating said adjustor in a predetermined direction in response to the reciprocating movement of said adjustor, whereby said adjust bolt is shifted in an axial direction by the unidirectional rotation of said adjustor to increase the effective length of said outer wire.

4,543,850
NEUTRAL LOCK MECHANISM FOR A DIRECTION AND SPEED CONTROL PEDAL

Richard D. Bednar, and James K. Hampton, both of Lake Mills, Wis., assignors to Ransomes, Inc., Johnson Creek, Wis.

Filed Jun. 20, 1983, Ser. No. 506,055
Int. Cl.⁴ G05G 1/14, 5/06
U.S. Cl. 74—512 **5 Claims**



1. In a direction and speed control for a vehicle, a floor plate, a pedal pivotally mounted intermediate its ends to said floor plate, down-toe motion by the operator's foot on the pedal causing forward motion of the vehicle, and down-heel movement by the operator's foot causing rear movement of the vehicle, a latch pivotally connected to the underside of the pedal and movable between a latching position wherein said latch engages an edge of the floor plate and an unlatching position, biasing means for urging the Latch to the latching position, and a lever arm secured to said latch and disposed beneath the pedal, said pedal having an opening therein and the end of said lever being bent and projecting upwardly through said opening to a location where said end can be engaged by the operator's foot when in a normal operating position, depressing of said end by the operator's foot acting to pivot said latch from the latching to the release position against the force of said biasing means to thereby permit pivotal movement of said pedal.

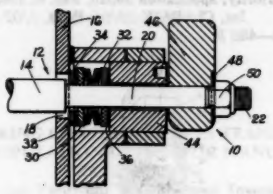
5. In a direction and speed control mechanism for a vehicle, a floor plate having an opening therein, a pedal pivotally mounted intermediate its ends to said floor plate, toe down motion by the operator foot on the pedal causing forward movement of the vehicle and heel down motion by the operator's foot causing rear movement of the vehicle, said pedal having a hole therein located forwardly of the pivotal connection of the pedal to the floor plate, means pivotally connected to the under-side of the pedal and including a latch disposed to engage an edge of the floor plate bordering the forward portion of said opening, a release lever connected to the latch and disposed to extend upwardly through the hole when the pedal is in a neutral position, said last named means also including a biasing member operably connected to the latch for biasing the latch to the latching position, engagement of the release lever by the operator's foot moving the latch from the latching position to the release position whereby the pedal can then be freely pivoted about its mounting.

4,543,851
TORQUE APPLICATION ASSEMBLY FOR CLOSURE VALVE OF A RAILROAD HOPPER CAR OUTLET

Richard L. Gilbert, Foley, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.

Filed Jun. 23, 1982, Ser. No. 391,328
Int. Cl.⁴ G05G 5/16
U.S. Cl. 74—531 **6 Claims**

1. A torque application assembly comprising: an operating shaft having a non-round connection portion; said shaft extending through a fixed wall; at least one metal washer spaced axially outwardly from said wall and being rotatably connected to said non-round portion of said shaft so as to be rotatable therewith; a resilient means engaging said metal washer; means for compressing said metal washer and said resilient means between said wall and said compressing means; at least

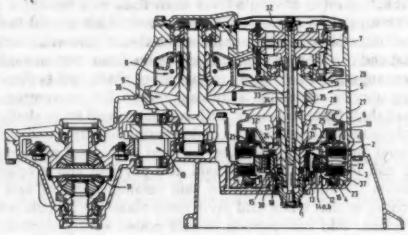


one low friction washer located between said metal washer and said wall whereby a predetermined torque is required to rotate said operating shaft, wherein said resilient means engaging a second metal washer having an opening of sufficient size to allow rotation of said operating shaft.

4,543,852
CLUTCH ASSEMBLY FOR A PLANETARY FORWARD REVERSE GEAR SET

Eugen Svab, Cologne, Fed. Rep. of Germany; Petrus H. van Deursen, Asten, and Theodorus P. M. Cadée, Goirle, both of Netherlands, assignors to Ford-Werke Aktiengesellschaft and Van Doorne's Transmissie B.V., both of, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,857
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241789
Int. Cl.⁴ F16H 37/08
U.S. Cl. 74—695 **8 Claims**



1. A clutch assembly for a planetary forward-reverse gear set in a transmission mechanism for vehicles, in particular for automobiles with a front wheel drive, comprising

a forward friction disk clutch and a reverse friction disk brake each operated through a servo piston and servo cylinder unit to shift said planetary gear set selectively into a forward and a reverse driving direction of the transmission mechanism,

a continuously variable pulley drive having a primary pulley, a secondary pulley and a driving belt for transferring power between these two pulleys each of which comprises a fixed sheave and a movable sheave, whereby at least the movable sheave of the primary pulley is adjustable by means of a hydraulic adjusting means comprising an adjusting piston and adjusting cylinder unit with respect to its coordinated fixed sheave that is fixedly connected to an input drive shaft of the transmission mechanism,

the input drive shaft carrying an interconnected sun gear of said planetary gear set which further has a pinion carrier for pinion gears that is connected to the input drive shaft

only when said forward friction disk clutch is operated and which also has a ring gear that is connected to the transmission housing only when said reverse friction disk brake is operated to provide said forward and reverse driving directions, respectively,

the adjusting piston of said hydraulic adjusting means being fixedly connected in an axially stationary manner to the adjacently arranged servo cylinder of the servo piston provided for the operation of said forward friction disk clutch, whereby the servo piston is at least partly surrounded by said adjusting cylinder which is fixedly connected to the movable sheave of the primary pulley of said pulley drive.

4,543,853

MOUNTING OF A DIFFERENTIAL GEAR IN AN UNDIVIDED AXLE HOUSING

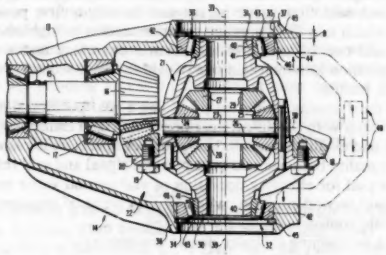
Götz von Hiddessen, Uhingen, and Dieter Wachtel, Korb, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 826,840, Aug. 22, 1977, abandoned. This application Jun. 1, 1982, Ser. No. 383,943

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639150

Int. Cl.⁴ F16H *1/40*

U.S. Cl. 74—713 **7 Claims**



2. Bearing apparatus for spreading apart the axle gear housing of a bearing having a differential gear housing with a ring gear attached thereto and meshing with a drive pinion having an axis of rotation which pinion is arranged perpendicularly to a bearing axis having an axis of rotation, and with differential gears contained therein in a bevel gear construction mode in a one-piece axle gear housing, two antifriction bearings arranged on the axis of rotation of differential gears on both sides of the differential gears, wherein outer races of the antifriction bearings are supported in mutually aligned bearing eyes developed as part of the axle gear housing and are supported thereat by way of fixed abutments, the inner races of the antifriction bearings being seated on bearing necks of the differential gear housing and being supported on collars facing away from the differential gear housing, wherein the differential gear housing, the ring gear, the differential gears, the inner races mounted each on one of the bearing necks, and an associated cage which guides the antifriction bearings can be inserted as a preassembled module in the axle gear housing by way of a mounting aperture, which aperture is located in the axle gear housing facing away from the drive pinion, the axis of the aperture extending at right angles to the bearing axis and in the same direction as the axis of a shaft carrying the drive pinion, and where the two antifriction bearings, by means of supports, are held under an initial bearing stress resulting from spreading of the axle housing in a direction of the axis of the bearing, and where the bearing eyes and the axle housing are developed in one part wherein securing rings inserted in grooves of the bearing eyes serve as abutments; pocket-like recesses are formed on an inner wall of one or both bearing eyes of the axle gear housing;

the two antifriction bearings have the same distance to the axis of rotation of the drive pinion; and the preassembled constructional unit also contains the inside bearing race and cage of the other antifriction bearings, further comprising

a spreading apparatus having a pressure medium servo cylinder, supportable with one of its ends against an end of a bearing eye on the outside of the axle housing, which accommodates a pressure medium servo piston movable in the direction of the bearing axis with a plunger attached to this piston and supportable in the associated bearing neck, this pressure medium servo cylinder being connected with a counter holder exhibiting a supporting arm, which latter can be introduced into the mounting aperture and can be supported against an end of the bearing eye on the inside of the axle housing.

4,543,854

DIFFERENTIAL GEAR MECHANISM

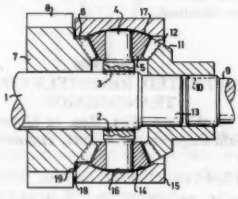
Jan Roth, Angered, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Jan. 5, 1984, Ser. No. 569,461

Claims priority, application Sweden, Jan. 11, 1983, 8300100

Int. Cl.⁴ F16H *1/40, 1/38*

U.S. Cl. 74—713 **2 Claims**



1. Differential gear mechanism, comprising a side pinion carrier which is non-rotatably joined to a first shaft and has radially directed cross shafts on which bevelled side pinions with part-spherical outer contours are rotatably journalled; a first bevelled side gear which is freely rotatably journalled on the first shaft and engages the bevelled side pinions; a second side gear which is non-rotatably joined to a second shaft and engages the side pinions; and an outer ring which surrounds the side pinion carrier and the side pinions and has a part-spherical interior contour which conforms to the outer contours of the side pinions; characterized in that the outer ring is not fixed to the side pinion carrier and has, in order to prevent tipping of the ring relative to the other components, an abutment surface adjacent to an abutment surface which is fixed axially relative to the shafts.

4,543,855

METHOD FOR OPERATING A VEHICLE HAVING AN AUTOMATIC, CONTINUOUSLY VARIABLE GEAR RATIO TRANSMISSION

Hermann Oetting, Brunswick; Paulus Heidemeyer, Wolfsburg, and Frank Zimmermann, Brunswick, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,840

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212091

Int. Cl.⁴ B60K *41/14*

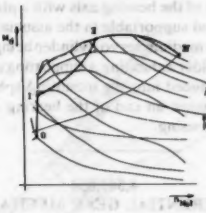
U.S. Cl. 74—859 **8 Claims**

1. A method for operating a vehicle having an engine, an accelerator pedal, a throttle valve, and an automatic, continuously variable gear ratio transmission comprising the steps of:

during a first control phase, maintaining the engine speed at a substantially constant value while increasing the trans-

mission gear ratio to the maximum transmission gear ration;

during a second control phase, maintaining the transmission gear ratio at the maximum transmission gear ratio while increasing the engine speed to the maximum engine speed possible at the maximum transmission gear ratio and selected throttle valve angle; and



during a third control phase effective only after reaching said maximum possible engine speed at said maximum transmission gear ratio and selected throttle valve angle, decreasing the transmission gear ratio from the maximum transmission gear ratio, whereby higher vehicle traveling speeds are obtained.

4,543,856

POWER OPERATED, REMOTELY CONTROLLED TRANSMISSION

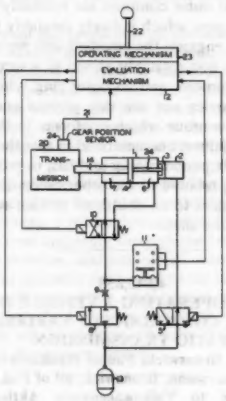
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hannover, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,431

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108781

Int. Cl.[4] B60K *41/08;* **F16D** *67/00, 23/10, 11/00*

U.S. Cl. 74—866 **5 Claims**



1. A power operated transmission control system comprising:

(a) a transmission having different gears;

(b) gearshift means having different positions for selecting the different gears of said transmission;

(c) a source of fluid under pressure;

(d) a power cylinder device comprising:

(i) a first cylinder;

(ii) a power piston operatively disposed in said first cylinder and forming in cooperation therewith a first pressure chamber on one side of said power piston and a second pressure chamber on the opposite side of said power piston;

(iii) a first piston rod connected to said power piston and adapted to effect engagement of said transmission gears;

(e) first sensing means for providing a reference signal that varies in accordance with the position of said gearshift means;

(f) first valve means having a first position for establishing fluid pressure communication between said source and one of said first and second pressure chambers, whereby said power piston is actuated to effect engagement of said transmission gears by said rod, and a second position for interrupting said fluid pressure communication;

(g) second sensing means for providing a feedback signal corresponding to the fluid pressure supplied to said one of said first and second pressure chambers;

(h) evaluation means operative in response to said feedback signal being less than said reference signal for effecting operation of said first valve means to said first position, and operative in response to said feedback signal being at least equal to said reference signal for effecting operation of said first valve means to said second position, whereby the fluid pressure supplied to said one of said first and second pressure chambers and accordingly the force of engagement of said transmission gear is varied according to the gear selected;

(i) second valve means interposed between said power cylinder and said first valve means and having a first position in which said fluid pressure communication is established with said one of said first and second chambers and a second position in which said one of said first and second chambers is vented;

(j) third sensing means for providing a gear position signal that varies with the actual gear position of said transmission; and

(k) said evaluation means being further operative in response to equality between said gear position signal and said reference signal for effecting operation of said second valve means to said second position, whereby said force of engagement of said transmission gear is relieved;

(l) a positioning cylinder device comprising:

(i) a second cylinder;

(ii) an auxiliary piston operatively disposed in said second cylinder and forming in cooperation therewith a third pressure chamber; and

(iii) a second piston rod connected to said auxiliary piston and adapted to engage said power piston; and

(m) third valve means having a first position for establishing fluid pressure communication between said source and said third pressure chamber when said gearshift means is operative in a forward mode, whereby said second piston rod of said auxiliary piston engages said power piston to define a neutral position thereof from which neutral position said power piston is prevented from being actuated in response to pressurization of the other one of said first and second pressure chambers.

4,543,857

SURGICAL INSTRUMENT AND METHOD OF MAKING SAME

Larry K. Kleinberg, Burbank, and Don S. Evans, Pasadena, both of Calif., assignors to Urban Engineering Co., Inc., Burbank, Calif.

Filed Dec. 9, 1983, Ser. No. 559,387

Int. Cl.[4] B24B *1/00, 3/00*

U.S. Cl. 76—101 R **19 Claims**

1. A method of forming a positive cutting angle across the thickness of a tubular wall forming a cutting edge about a compound oval opening in a tubular member having such wall and comprising the steps of

(1) securing a fixture including a bore terminating at an end face for the fixture,

(2) inserting into the fixture's bore a cylindrical unit comprising a spindle and a tubular member with such an opening

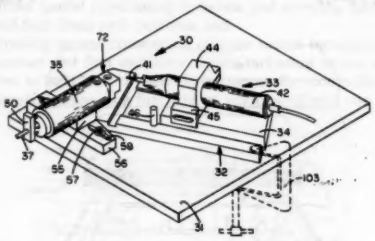
in its tubular wall, at least the opening projecting outwardly of the fixture's face and having on the spindle a follower extending therefrom in an angular direction,

(3) positioning a camming surface relative to such follower for cooperative engagement during subsequent grinding action on the cutting edge,

(4) engaging the spindle's follower with the camming surface,

(5) securing the spindle to the fixture,

(6) setting the extent of the projection of the tubular member's compound oval opening,



(7) registering the cutting edge about such opening in a proper position for subsequent grinding action thereon,

(8) securing the tubular member to the spindle,

(9) unsecuring the cylindrical unit from the fixture, and

(10) causing the follower to follow the camming surface during grinding action on the cutting edge forming the compound oval opening.

12. A cutting instrument having a positive cutting angle formed by the method of claim 1 or claim 2 or claim 3.

4,543,858

HANDLE FOR STRAP WRENCHES AND OTHER TOOLS

Stephen K. Luck, 9249 Lemon Ave., La Mesa, Calif. 92041

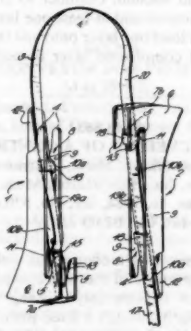
PCT No. PCT/GB80/00044, § 371 Date Nov. 14, 1980, § 102(e) Date Nov. 14, 1980, PCT Pub. No. WO80/01887, PCT Pub. Date Sep. 18, 1980

PCT Filed Mar. 13, 1980, Ser. No. 224,554

Claims priority, application United Kingdom, Mar. 14, 1979, 7909068; Apr. 3, 1979, 7911519

Int. Cl.[4] B25B *13/52*

U.S. Cl. 81—64 **15 Claims**



1. A strap wrench of the type including a handle and an elongate flexible member attached to said handle with said flexible member forming a loop; the improvement wherein said handle comprises separably formed first and second components, each component having joining means for releasably joining together said first and second components to form said assembled handle, said joining means including a projection provided on at least one of said components, and the other of said components being provided with a complementary recess within which said projection is received during assembly of said handle.

4,543,859

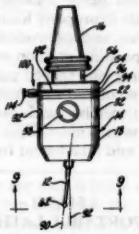
PROBE ADJUSTMENT TOOL AND METHOD OF USING SAME

Robert F. Cusack, Grosse Pointe, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Division of Ser. No. 504,149, Jun. 14, 1983, Pat. No. 4,510,693, which is a continuation-in-part of Ser. No. 388,187, Jun. 14, 1982, Pat. No. 4,451,987. This application Nov. 15, 1984, Ser. No. 671,860

Int. Cl.[4] B25B *15/00*

U.S. Cl. 81—484 **3 Claims**



1. A tool for use in adjusting a probe assembly including a pair of beveled washers adapted to be rotated with respect to each other to adjust the tilt of a stylus extending from one end of a probe housing, said tool comprising:

a pair of arcuate caliper arms, each arm having inwardly directed pins for engaging openings in the washers, and manually adjustable means for engaging the arms and simultaneously moving said pins relative to each other to thereby rotate the washers.

4,543,860

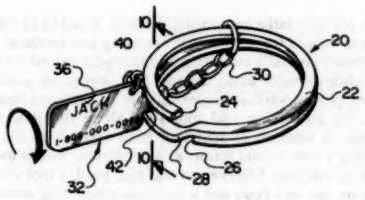
KEY RING ATTACHMENT

James A. Van Meter, 15357 Magnolia Blvd., Van Nuys, Calif. 91404

Continuation-in-part of Ser. No. 427,670, Sep. 29, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,194

Int. Cl.[4] B25B *33/00*

U.S. Cl. 81—488 **2 Claims**



1. In combination with a split key ring adapted to support a plurality of different keys for locks, said split key ring being constructed of a rigid thin strip of material which is helically wound on itself forming a plurality of abutting ring shaped members, said strip terminating in ends, the improvement comprising:

a sheet material attachment to facilitate the spreading apart of a portion of said abutting ring shaped members so as to permit ease of insertion of a key on said strip, said attach-

ment comprising an enlarged body section which is readily graspable by a human being and a protrusion integrally attached to said enlarged body section and extending therefrom, said protrusion to be wedged between said abutting ring shaped members adjacent a said end thereby spacing said end from the directly adjacent ring shaped member facilitating locating of a key on said strip, said protrusion having an outermost edge being sharpened to facilitate wedging between said abutting ring shaped members;

a necked down area between said protrusion and said enlarged body section, said necked down area being of a width less than both said protrusion and said enlarged body section, said necked down area having side walls, said side walls being planar, the lateral cross sectional configuration of said necked down area being of a rectangular configuration; and

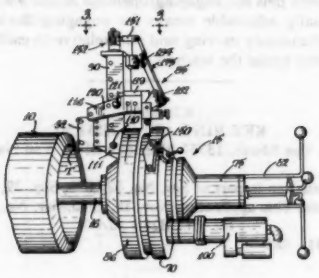
the portion of said protrusion located directly adjacent said necked down area being smoothly contoured so as to function as a guide to properly locate said strip within said necked-down area, said protrusion to be pivoted ninety degrees to an operating position when fully wedged between said abutting ring shaped members thereby further spacing of said end of said strip from the directly adjacent said ring shaped member with said attachment on said operating position said inner edges preventing accidental dislodgement of said attachment from said key ring.

4,543,861

PORTABLE LATHE

Horst Kwech, Lake Bluff, and Peter K. Olson, Buffalo Grove, both of Ill., assignors to The E. H. Wachs Company, Wheeling, Ill.

Filed May 11, 1984, Ser. No. 610,656
Int. Cl.[4] B23B *5/16*
U.S. Cl. 82—4 C **5 Claims**



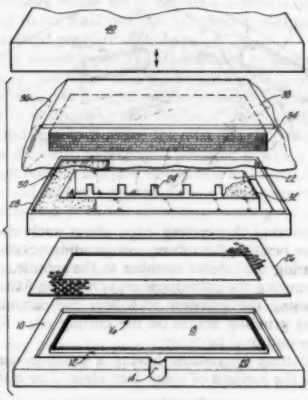
1. A portable lathe comprising, a frame, a tool head rotatably mounted on said frame, means for rotating said toolhead, a tool post, means pivotally mounting said tool post on said tool head, a tool slide movable along the tool post, means for positioning the tool post at various angles relative to said tool head, and means for advancing said tool slide along the tool post in response to rotation of said tool head relative to the frame including a cam on said frame, a cam follower, means movably mounting said cam follower on said tool head, a tool slide feed means on the tool post, and a motion-transmitting connection between said cam follower and said tool slide feed means including a rigid link having two interconnected elongate members with one member connected at an end to the cam follower and the other member connected at an end to the tool slide feed means and with the members between said ends having their lengths associated together in overlapped sliding relation to vary the length of the link dependent on the overlap between the elongate members to accommodate said various tool post angles, and means for fixedly interconnecting said elongate members whereby the motion of the cam follower is transmitted through the link to the tool slide feed means to feed the tool slide.

4,543,862

VACUUM DIE CUTTING APPARATUS FOR FOAM BACKED MATERIALS

Martin M. Levene, and William W. Lessard, both of Kitchener, Canada, assignors to Ontario Die Company Limited, Ontario, Canada

Filed Mar. 19, 1984, Ser. No. 590,961
Int. Cl.[4] B26D *7/02*
U.S. Cl. 83—19 **9 Claims**



1. A method of cutting compressible material in a predetermined pattern comprising the steps of:

(a) attaching a steel rule, defining a closed figure to a base with the steel rule extending upwardly to present a sharpened upper edge having a shape conforming to said predetermined cutting pattern;

(b) placing at least one layer of said material over said sharpened upper edge of said steel rule;

(c) covering said at least one layer and said base with an air-impervious cover sheet to form a vacuum chamber between said base and said cover sheet enclosing said at least one layer;

(d) evacuating said vacuum chamber to compress and reduce the thickness of said at least one layer; and

(e) pressing said at least one layer onto and through said steel rule to cut said compressed layer in said predetermined pattern.

4,543,863

CONTROLLED SEVERING OF A CONTINUOUS WEB

Robert R. Rader, Port Huron, Mich., assignor to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Filed Jan. 16, 1984, Ser. No. 570,698
Int. Cl.[4] B23Q *15/12*
U.S. Cl. 83—76 **13 Claims**

1. Apparatus for severing a continuous web at preselected locations spaced lengthwise of the web comprising

first drive means for continuously moving the web in the direction of its length through a fixed path,

severing means positioned adjacent to said path and including second drive means for periodically moving said severing means into engagement with said web at a first predetermined fixed position in said path,

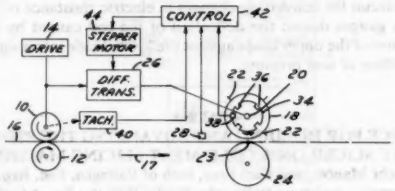
common drive means connected to one of said first and second drive means and differential transmission means connecting said common drive means to the other of said first and second drive means, said differential transmission means includ-

ing a stepper motor for selectively advancing or retarding velocity of said other of said first and second drive means relative to velocity of said one of said first and second drive means.

first sensor means comprising a first sensor disposed in a second fixed position along said path and responsive to motion of said web for providing a first sensor signal indicative of a predetermined spatial relationship between a said preselected location in said web and said first fixed path position,

second sensor means comprising a second sensor disposed in fixed position relative to motion of said severing means for providing a second sensor signal indicative of a predetermined spatial relationship between said severing means and said first fixed path position, and

controlling means comprising counter means including a first counter and first oscillator means including means responsive to said one of said drive means for controlling said counter means as a function of velocity of said one of said



drive means, means responsive to occurrence of the first of said first and second sensor signals for activating said counter means, means responsive to occurrence of the other of said first and second sensor signals to terminate operation of said counter means, at which point said counter means has a count output indicative of an amount of required motion correction, and means including second oscillator means responsive to said count output of said counter means for selectively applying pulsed advance or retard correction signals to said stepper motor for selectively advancing or retarding motion of the other of said first and second drive means relative to said one of said first and second drive means following occurrence of said other of said sensor signals, said second oscillator means comprising means for varying the frequency of said correction signals over a control cycle in a manner predetermined not to exceed the acceleration and deceleration capabilities of said stepper motor.

4,543,864

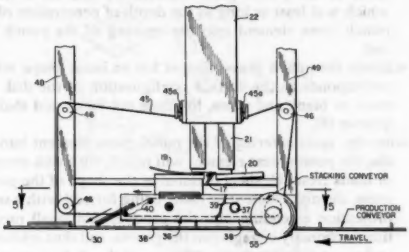
STACKING CONVEYOR FOR PRODUCT SLICING MACHINE

Thomas A. Hochanadel, Pickerington, and Robert J. McInerney, Columbus, both of Ohio, assignors to J. E. Grote Company, Blacklick, Ohio

Filed Oct. 7, 1983, Ser. No. 540,196
Int. Cl.⁴ B26D *7/06*
U.S. Cl. 83—91 **8 Claims**

1. A stacking apparatus for vertically stacking a plurality of relatively thin, flexible sheet-form product slices disposed in coplaner relationship to a substantially horizontal plane and moving in series along a generally horizontally disposed path and gravity deposited at a receiving station into a stack of slices of predetermined superposed configuration comprising

a stacking conveyor positionable at the slice receiving station and having a conveyor belt supported for displacement in longitudinal alignment with the path of movement of the product slices, said belt having an upper run forming a slice receiving surface disposed in a substantially horizontal plane underlying the path of movement of the product slices to be received thereon, the upper run of said conveyor belt being selectively displaceable in said horizontal plane along a path aligned with the path of movement of the slices, and drive means operatively coupled with said conveyor belt responsive to a slice being deposited on said conveyor and operable for selectively displacing said conveyor belt to reciprocably displace the upper run thereof from a first position to a second position where the slice being deposited is fully received thereon in a same direction as that of a gravity-fed slice being deposited thereon at substantially the same horizontal velocity of the slice being received whereby the receiving surface is maintained essentially stationary with respect to the



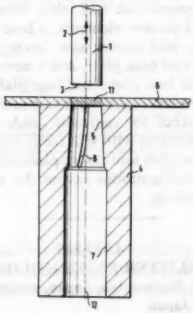
moving slice while the slice is being received and to then displace the upper run thereof in the opposite direction to a predetermined position relative to said first position for receiving thereon a next successive gravity-fed slice in superposed stacked relationship to the previously received slice, said drive means alternatively selectively operable in response to a predetermined number of slices having beeen deposited thereon in a formed stack for displacing said conveyor belt upper run to discharge a formed stack of product slices from the conveyor.

4,543,865

PUNCH PRESS TOOL FOR PUNCHING SMALL HOLES IN A STRIP OF SHEET METAL, AND OBTAINING SMALL PUNCHED BLANKS

Wiestaw Kramski, Pforzheim, Fed. Rep. of Germany, assignor to Kramski GmbH Prazisionswerkzeuge-Metallwaren, Birkenfeld, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,448
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1982, 3222440
Int. Cl.⁴ B21D *45/08*
U.S. Cl. 83—146 **20 Claims**



1. Punch press tool for punching small disk elements or blanks (**11**) from sheet material (**6**) having

a punch die (**4**) being formed with a continuous receiving and removal opening (**5**) for the disk elements or blanks;

and a punch press element (1) having an outer shape and diameter fitting into the opening (5) of the die, reciprocatingly operable to enter into the opening for entirely severing a disk element or blank (11) from the sheet material, and remove the disk element or blank from the punch die, the punch press element withdrawing from the punch die after having entered the punch die;

wherein, in accordance with the invention

the wall of the opening (5) of the punch die is formed with at least one shallow groove (8) having a dimension small with respect to the surface area of the disk elements or blanks extending in the direction of the severing movement of the punch press element (1) and for a length which is at least as long as the depth of penetration of the punch press element into the opening of the punch die; and

wherein the punch press element has an outer shape which corresponds to the surface configuration of the disk element or blank and spans, but does not enter said shallow groove (8),

whereby, upon entering of the punch press element into the die, the punch press element will punch out a disk element or blank from the sheet material in the shape of the punch press, the disk element or blank being formed with a small projection extending into the groove, said small projection frictionally engaging in the groove and thus inhibiting undesired following, or adhesion of the disk element or blank to the punch element upon withdrawal operation of the punch element from said opening.

4,543,866

TABLE SAW OUTFIT

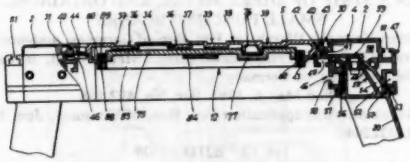
Peter Maier, Gerokstrasse 1, D-7311 Neidlingen, and Albert Sigel, Scholderplatz 21, D-7315 Weilheim, both of Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,540

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302482

Int. Cl.⁴ B27B *5/16*

U.S. Cl. 83—471.3 **31 Claims**



1. A saw table outfit comprising a table frame, a power saw with a blade supported on said table frame, said table frame being made up of section elements, a base plate fixed on said section elements, said power saw having its blade running through a gap in said base plate, and a cover plate for shutting off said gap in said base plate, said base plate having ends with teeth therein and a lower side with stop and guide means in the cross section thereof for said saw, ends of said gap being toothed and interlocked with said teeth formed on the ends of said cover plate so that said cover plate may be moved into a number of different positions across the width thereof with said teeth interlocking.

4,543,867

SLITTER KNIFE HOLDER

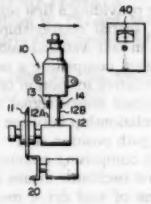
Shigeru Ichikawa, Fujinomiya, Japan, assignor to Meisan Ltd., Co., Shizuoka, Japan

Filed Mar. 22, 1984, Ser. No. 592,228

Int. Cl.⁴ B23D *19/04;* B26D *1/24*

U.S. Cl. 83—502 **6 Claims**

1. A slitter knife holder apparatus for a slitter knife, the slitter knife including an upper blade and a lower blade, the lower blade being fixed in the direction of the axis of rotation of the lower blade and the upper blade being biased in the direction of the axis of rotation of the upper blade so that an overlapping portion of the upper blade is biased toward an adjacent portion of the lower blade, said slitter knife holder



apparatus comprising a rod for supporting the upper blade of the slitter knife, strain gauges attached to the rod and a conversion circuit for converting changes in electric resistance of the strain gauges due to the deflection of the rod caused by the pressure of the upper blade against the lower blade into a signal indicative of said pressure.

4,543,868

DEVICE FOR HOLDING AND ADVANCING THE STOCK TO BE SLICED ON A COLD MEAT SLICING MACHINE

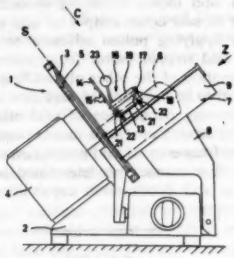
Albrecht Maurer, and Karl Frey, both of Balingen, Fed. Rep. of Germany, assignors to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,666

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304612

Int. Cl.⁴ B26D *7/06*

U.S. Cl. 83—713 **3 Claims**



1. Device for holding and advancing the stock to be sliced on a cold meat slicing machine comprising a machine frame, a circular cutter blade (3) driven in a rotating manner, a displaceable carriage (8) for the stock to be sliced, and a base (13) extending parallel to the direction of advance (Z) of the stock to be sliced towards the circular cutter blade (3) and pivotably mounted on the carriage for slidable displacement transversely to the direction of displacement of the carriage and positionable on the stock to be sliced, characterized in that there is pivotably mounted on the base (13) a gripper (16) having a pivot axis (17) and with at least two fingers (21) protruding from said pivot axis (17), and one curved, pointed needle (22) protruding from each of the fingers, and in that the gripper comprises a manual lever (23) by means of which the needles may be pressed into the stock to be sliced (6), the fingers (21) being arranged in the direction of the pivot axis (17), one behind the other, said needles being curved concentrically with said pivot axis, and said pivot axis extending parallel to said direction of advance (Z); and a leg (14) of plate-shaped configuration, comprising projecting spikes (15) on the side facing the circular cutter blade, protruding from said base (13)

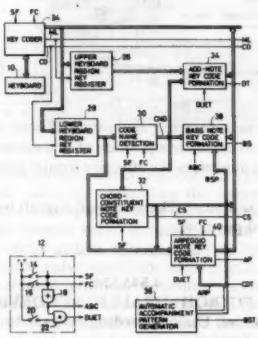
and extending parallel to the cutting plane (S) and perpendicularly to the direction of advance (Z).

4,543,869

ELECTRONIC MUSICAL INSTRUMENT PRODUCING CHORD TONES UTILIZING CHANNEL ASSIGNMENT

Susumu Kawashima, Hamamatsu, and Shigeru Yamada, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 20, 1984, Ser. No. 591,424
Claims priority, application Japan, Mar. 31, 1983, 58-056630
Int. Cl.⁴ G10H *1/38, 7/00*
U.S. Cl. 84—1.01 **2 Claims**



1. An electronic musical instrument, comprising:

keyboard means having keys representing respective notes and being capable of being depressed;

key data generating means for generating a plurality of key data representing, respectively, a plurality of tones to be sounded based on depression of the keys in said keyboard means;

tone production means having a plurality of tone production channels each for producing a tone as designated by any one of said key data; and

channel assignment means for respectively assigning a plurality of said key data supplied from said key data generating means to said plurality of tone production channels of said tone production means each to designate a tone to be produced therefrom; the improvement wherein

said key data generating means comprises:

first key data generating means for generating a plurality of key data representative, respectively, of the plurality of tones which are to be sounded simultaneously as a chord based on the key depression of the key or keys in said keyboard means;

second key data generating means for successively generating a plurality of key data representative, respectively, of the plurality of tones which are to be sounded in succession as a broken chord based on the depression of the keys in said keyboard means; and

third key data generating means for generating a key data representative of a tone different from said plurality of tones which are to be sounded simultaneously based on the depression of the keys in said keyboard means,

said electronic musical instrument further comprising:

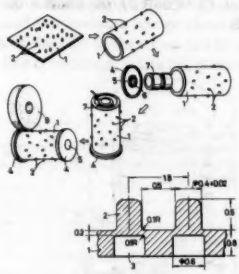
controlling means for supplying a controlling signal to said channel assignment means to thereby cause this latter means to selectively perform either one of a first operation of respectively assigning the plurality of key data from said first key data generating means to said plurality of tone production channels, and a second operation of respectively assigning the key data from said second key data generating means and the key data from said third key data generating means to at least two among said plurality of tone production channels.

4,543,870

DRUM FOR MUSIC BOX

Yasuhide Kitazawa, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 27, 1984, Ser. No. 594,264
Int. Cl.⁴ G10F *1/06*
U.S. Cl. 84—96 **12 Claims**



1. A drum for a music box comprising a plate having a number of pins on its outer surface, said plate being shaped into a cylinder, and a number of holes corresponding to said number of pins, said pins each having a substantially uniform diameter from a distal end to a proximal end of the pin, said holes each having a depth (De) which is smaller than a thickness of said plate and is greater than half the thickness (Tp) of said plate, said holes being formed in a backface of said plate, said pins each having the diameter (Dp) which is smaller than a diameter (Dh) of said holes and is greater than half the diameter (Dh) of said holes, said pins being formed on the outer face of said plate substantially coaxially with the associated holes, and both ends of said plate being butted together to form the cylinder;

wherein:

Tp > Dh and

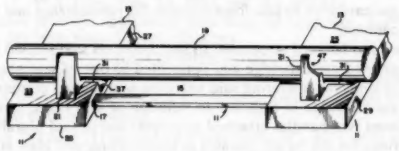
Dp is kept substantially constant.

4,543,871

PERCUSSION BAR INSTRUMENT

Garry M. Kvistad, R.D. 1, Box 381A, West Hurley, N.Y. 12491

Filed Aug. 18, 1983, Ser. No. 524,378
Int. Cl.⁴ G10D *13/08*
U.S. Cl. 84—403 **14 Claims**



1. A percussion bar instrument for utilizing percussion bars of varying lengths in a variety of arrangements with each bar held at its nodal points, said percussion bar instrument comprising:

a pair of mounting members with a plurality of opposing upper grooves in each member;

means for holding the pair of mounting members in a spaced relationship to one another;

a plurality of cradles each slidably mounted in the upper

grooves of the pair of mounting members and including an opposing pair of nodal pins; and

percussion bars mounted in said cradles, each percussion bar having a pair of opposing openings at its nodal points adapted to receive the nodal pins of the cradles.

4,543,872

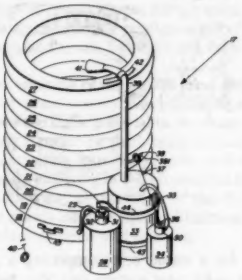
BLAST ATTENUATOR

Kenneth J. Graham, 2012 Coral Sea Cr., and Robert G. S. Sewell, 313 E. Far Vista, both of Ridgecrest, Calif. 93555

Filed Aug. 8, 1983, Ser. No. 520,926

Int. Cl.[4] C06B *21/00*; E06B *9/00*

U.S. Cl. 86—1 B **1 Claim**



1. A bomb blast attenuator utilizing aqueous film forming foam (AFFF), comprising:

a foam containing body having an open top end, a bottom end, and a plurality of individually gas inflatable, serially interconnected and stacked, toroidal shaped flexible plastic rings defining an interior volume surrounded by walls;

a flexible plastic sheet bonded across said bottom end of said body, having an overlapping slit across its diameter and having a circular opening in the center of said sheet for facilitating the insertion of a blast producing device;

a first compressed gas cartridge having a valve;

a first tube connecting said valve on said first compressed gas cartridge to said body for inflating said rings on command;

a first lanyard connected to said valve on said first compressed gas cartridge for remote operation of said valve on said first compressed gas cartridge by an operator;

a foam canister attached to the exterior of said body and having a second tube extending from said foam canister to the open top end of said body;

a foam nozzle attached to said second tube for dispensing AFFF into said interior volume;

a second compressed gas cartridge having a valve;

a third tube connecting said valve on said second compressed gas cartridge to said foam canister for pressurizing said foam canister;

a second lanyard connected to said valve on said second compressed gas cartridge and connected to one of said plurality of rings for operating said valve on said second compressed gas cartridge in response to inflation of said rings; and

at least two handles attached to at least one of said plurality of rings for use by an operator in transporting said blast attenuator.

4,543,873

METHOD AND SYSTEM FOR STORE RACK CARRIAGE

William H. Stock, Columbus, Ohio, assignor to Rockwell International Corporation, El Segundo, Calif.

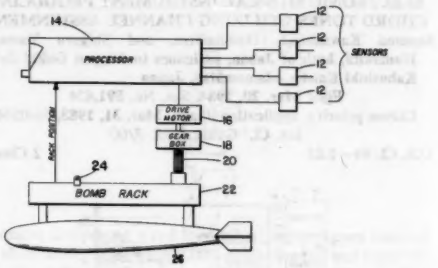
Filed May 4, 1983, Ser. No. 491,157

Int. Cl.[4] F41F *5/02*

U.S. Cl. 89—1.59 **10 Claims**

1. A method of minimizing drag forces on an aircraft from an externally mounted store during flight of the aircraft, comprising:

detecting selected airflow conditions and flight parameters on said aircraft;



processing said detected airflow conditions and flight parameters to calculate a position of said externally mounted store that minimizes the effective frontal area of said store; and

positioning said store relative to said aircraft based upon said calculated position.

4,543,874

ELECTROHYDRAULIC SET DEVICE

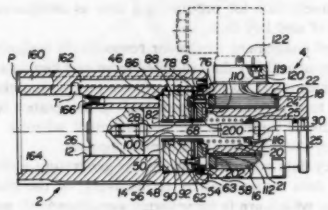
Goran Henriksson, Eksjö, Sweden, assignor to Olsbergs Hydraulic AB, Sweden

Continuation-in-part of Ser. No. 305,643, filed as PCT SE81/00015, Jan. 23, 1981, published as WO81/02185, Aug. 6, 1981, § 102(e) date Sep. 21, 1981, Pat. No. 4,475,441. This application Jul. 17, 1984, Ser. No. 631,607

Claims priority, application Sweden, Jan. 24, 1980, 8000575

Int. Cl.[4] F15B *13/16*

U.S. Cl. 91—387 **6 Claims**



1. An electrohydraulic set device including, as an output set element, a piston having a piston rod, the piston being operable against the action of a force of a hydraulic pressure that is supplied to an operating side of the piston via a valve passage which is opened and closed by a control slide operated by an electromagnet which can apply a magnetic force, a spring acting between the control slide and the piston such that the spring tends to move the control slide against the action of the magnetic force in a direction closing the passage, characterized in that the control slide surrounds the piston rod of the piston, the control slide being located together with a coil of the electromagnet and an associated armature in a common chamber with the coil encircling the piston rod, said operating side of the piston being in said common chamber, the armature being suspended in spring means permitting movement of the armature in the length direction of the control slide, and the control slide being abutingly engageable with the armature and operated by movement of the armature.

4,543,875

ELECTRO-HYDRAULIC DIRECTIONAL CONTROL VALVE

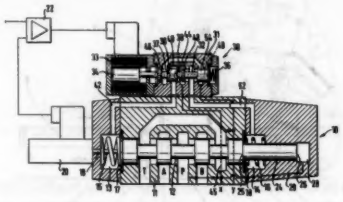
Rainer Imhof, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,436

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245259

Int. Cl.[4] F15B *13/044*

U.S. Cl. 91—459 5 Claims



1. An electro-hydraulic directional control valve comprising a main control valve for controlling the communication between a pressure source, a hydraulic actuator and a fluid reservoir, said main control valve including a main control spool supported for reciprocation, springs acting on opposite ends of said main control valve spool for urging said main control valve in a centered position, a control pressure chamber formed at one end of said main control valve spool for urging said main control valve spool axially in a first direction upon pressurization of said control pressure chamber and for urging of said main control valve spool in the opposite direction upon the communication of said control pressure chamber with said reservoir, a pilot control valve including a spring biased pilot control spool and a proportional solenoid for actuating said pilot control spool against the action of said spring, said pilot control spool being movable from a neutral position toward either side thereof to respective first and second operating positions, said pilot control valve spool being operative in said first position to pressurize said control pressure chamber and in said second position being operative to communicate said control pressure chamber with said reservoir, said spring biased pilot control spool being urged to a neutral position by said spring, the improvement comprising means forming a pressure chamber acting on said main control valve spool in a direction opposite to said control pressure chamber, and means to pressurize said control pressure chamber and said pressure chamber when said spring urges said pilot control valve spool to its neutral position for maintaining said main control valve spool in a neutral position and for communicating said pressure chamber with said reservoir when said pilot control valve spool is in said first and second operating position.

4,543,876

AXIAL PISTON MACHINE HAVING ADJUSTABLE HYDROSTATICALLY SUPPORTED SWASHPLATE

Walter Heyl, Johannesberg, and Thomas Loffler, Waldaschaff, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

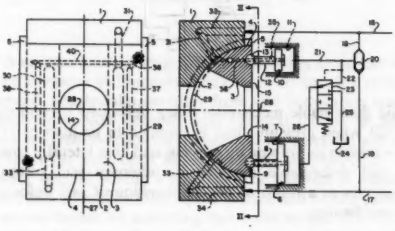
Filed Jan. 26, 1984, Ser. No. 573,948

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302763

Int. Cl.[4] F01B *13/04*; F04B *1/26*

U.S. Cl. 91—506 10 Claims

1. In an adjustable axial piston machine of swashplate form, in which the piston support surface or swashplate is formed on a semicylindrical rocker body whose cylindrical surface is supported by friction bearings in a hollow-cylindrical bearing body, a pressure pocket that is connected to a pressure-medium source, and in which the axial piston machine has two connections, including reversible feed line and low-pressure line connections, and the pressure pocket connected with the pressure-medium source is located on the side of the rocker body on which the working piston loaded with feed pressure is supported, the improvement comprising a servo piston on one side of the rocker body for rotating said rocker body in the bearing body, a counterforce generator in the other side of the rocker body, pressure pockets in the form of two channels in one of the bearing body and rocker body, reversing valve means between said reversible feed line and low pressure line connections maintaining feed line pressure on said counterforce generator when the piston machine is operative, a valve means between said reversible feed line and low pressure line connections selectively connecting said servo piston to one of said feed line and said low pressure line or closing the servo piston whereby each of the two connections can be selectively operated as a feed line connection, while the other connection is the



low pressure line connection and means connecting said channels to said connections whereby the channel that is located on the side of the rocker body on which the working piston loaded with feed pressure are supported is connected with the source of pressure medium, in which case the pressure medium source is the feed pressure line and at least one servo piston supported against the rocker body on one side of the axis of rotation and positioned at least approximately parallel to the working piston, a counter force generator supported against the rocker body on the other side of the rotation axis, and having at least one additional pressure pocket, which is acted upon by a pressure proportional to the pressure acting on the servo piston and is located on the side of the rocker body on which at least one of the servo piston and the counter force generator is supported against the rocker body.

4,543,877

DEVICE FOR THE PRODUCTION OF PRESSURE

Manfred Emmert, Postfach 12, 7859 Efringen-Kirchen, Fed. Rep. of Germany

PCT No. PCT/DE83/00055, § 371 Date Nov. 29, 1983, § 102(e) Date Nov. 29, 1983, PCT Pub. No. WO83/03448, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 24, 1983, Ser. No. 563,412

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212155; May 5, 1982, 3216753

Int. Cl.[4] F01B *19/00*

U.S. Cl. 92—90 10 Claims

1. A device for producing mechanical force by means of a pressure fluid comprising:

(a) a cylinder (1) having two side walls (9″, 10″) with surfaces (11″, 12″) which are plain-parallel to each other and having a lower side wall (8″) at right angle to said two side walls (9″, 10″);

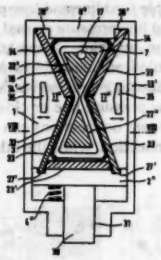
(b) a piston (2″) in said cylinder (1) between said two surfaces (11″, 12″) and guided by said cylinder (1) for movements along said two surfaces (11″, 12″);

(c) an elastic cylindrical sleeve (3) having two open edges, said sleeve being arranged in said cylinder (1) between said lower side wall (8″) and said piston (2″) with its edges in sealing contact with said two surfaces (11″, 12″);

(d) at least one bore (17) for said pressure fluid in one of said

two side walls (9'', 10'') communicating with the interior (7) of said sleeve (3);

(e) a deformable mechanism being arranged between said lower side wall (8'') and said piston (2'') and resting against an area of the outer surface of said sleeve (3) to deform said sleeve (3);



said deformable mechanism being deformed by said sleeve (3) when pressure fluid is supplied in its interior (7) increasing its volume by moving said area laterally towards said deformable mechanism, whereby said piston (2) moves as a result of the deformation of said deformable mechanism.

4,543,878

HEAT EFFICIENT COOKING APPARATUS

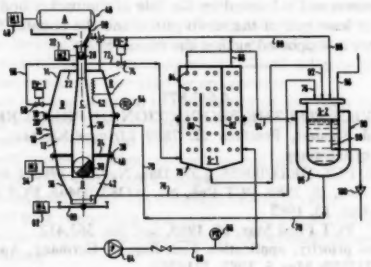
Lorenzo Luchetti, Terni, Italy, assignor to Interimport F. Caceffo GmbH, Bielefeld, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,333

Claims priority, application Italy, Oct. 3, 1983, 66711 A/83

Int. Cl.[4] A47J *27/04*

U.S. Cl. 99—330 **8 Claims**



1. An apparatus for cooking food items, in particular pasta, dehydrated vegetables or the like, comprising:

a common housing having an upper and a lower part;

a horizontal partition for separating the upper and lower parts of the common housing;

a hot water generator arranged in the upper part of the common housing;

an upper cover plate for the hot water generator;

a separating chamber arranged in the lower part of the common housing; and

a cooking chamber having a food inlet and a food outlet, and including an essentially cylindrical, vertical tube, wherein the vertical tube protrudes upwardly through the upper cover plate, and opens under said horizontal partition within the separating chamber.

4,543,879

PLANT FOR BRINGING ABOUT ENZYME-DEACTIVATION IN FRUIT AND VEGETABLES: TOMATOES IN PARTICULAR

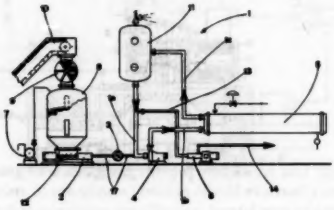
Camillo Catelli, Parma, Italy, assignor to Rossi & Catelli S.p.A., Italy

Division of Ser. No. 448,795, Dec. 10, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 630,017

Claims priority, application Italy, Dec. 10, 1981, 40125 A/81

Int. Cl.[4] A23L *1/212*

U.S. Cl. 99—472 **6 Claims**



1. Apparatus adapted for bringing about enzyme-deactivation in produce, comprising:

means for triturating the produce;

a pressurized system communicating with the produce triturating means and through which the produce is caused to circulate;

means communicating with the pressurized system and for substantially simultaneously introducing the produce into the pressurized system;

means communicating with the produce triturating means and for exposing the produce to a vacuum prior to or substantially simultaneously with the introduction of the produce into the pressurized system so that the trituration of the produce and subsequent introduction thereof into the pressurized system are carried out with attendant oxygen reduced to a minimum value;

means for heating the produce in the pressurized system; and

means for recirculating a portion of the produce in the pressurized system in such a way that produce newly introduced into the pressurized system comes into direct contact and mingles with the product already present therein.

4,543,880

METHOD AND A DEVICE FOR EXPELLING LIQUID BY SQUEEZING OF MASSES HAVING GREAT LIQUID CONTENT

Rolf Svensson, Skymningsvägen 16, S-198 00 Bålsta, Sweden

Filed Nov. 23, 1983, Ser. No. 554,738

Claims priority, application Sweden, Nov. 25, 1982, 8206727

Int. Cl.[4] B30B *9/24*

U.S. Cl. 100—37 **8 Claims**

8. A method for expelling liquid from a mass having an absorbed liquid content, said method comprising the steps of:

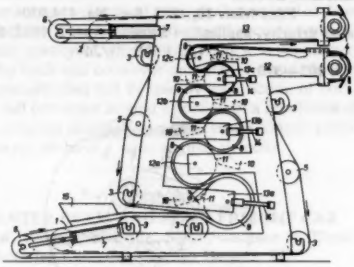
disposing the mass from which liquid is to be expelled between two endless filter cloths ahead of a squeeze zone;

causing said filter cloths to travel substantially in parallel through said squeeze zone with said mass therebetween; and,

squeezing said mass between said endless filter cloths by running said filter cloths in a winding path around a plurality of press rollers successively acting on said filter cloths only and not on each other in said squeeze zone;

the first of said rollers in said squeeze zone being the largest and said rollers progressively decreasing in diameter in the direction of travel of said filter cloths through said squeeze zone, and said rollers being laterally offset relative to each other and positioned adjacent to each other

such that said filter cloths with said mass therebetween encircle each of said rollers over more than half the periphery thereof and run directly between successive rollers without interposed transport distance so as to provide an uninterrupted and progressively increasing squeeze pressure on the mass between said filter cloths.

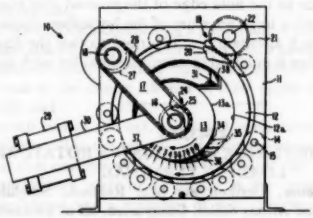


4,543,881

INTERNAL ROLL COMPRESSION SYSTEM

Graydon E. Anderson, 850 Latonka Dr., R.D. 4, Mercer, Pa. 16137

Filed Feb. 8, 1984, Ser. No. 577,981
Int. Cl.[4] B30B *9/20*
U.S. Cl. 100—121 **1 Claim**



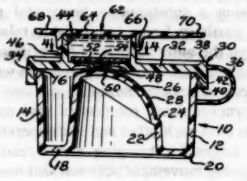
1. An internal roll compression system, comprising, in combination, a framework, a tubular outer roll carried rotatably free upon a plurality of bearing rollers supported on said framework, an inner roll rotatable within said outer roll and being eccentrically positioned respective thereto so as to form a pinch area therebetween leading to a final pinch point, a hub on opposite ends of said inner roll being supported rotatably free in bearings at one end of arms supported pivotally free at their other ends on a drive shaft of a first motor mounted stationarily on said framework; a first sprocket affixed on one of said hubs, a second sprocket affixed on said drive shaft, an endless chain around both said sprockets; a ring gear affixed to said outer roll being engaged by a gear affixed on a drive shaft of a second motor affixed on said framework; a hydraulic cylinder supported on said frame having a piston rod mounted rotatably free at its outer end on one of said hubs; and a conveyor belt under a hopper for shredded substances communicating with a wide entry space of said pinch area.

4,543,882

CONTACT LENS MARKING FIXTURE

Francis E. Ryder, 5 Pine Lake Dr., and Richard Rabenau, 24 Pine Lake Dr., both of Arab, Ala. 35016

Filed Jul. 16, 1984, Ser. No. 630,937
Int. Cl.[4] B41F *17/00*
U.S. Cl. 101—35 **16 Claims**



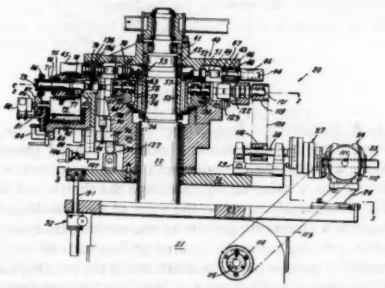
1. A contact lens marking fixture comprising a cup-like base having a bottom and an upstanding sidewall defining an open upper end, a pedestal upstanding from said bottom and spaced inwardly from said sidewall, said pedestal having an upper surface adapted to receive a contact lens for marking, and a lid received over said open upper end and supported by said sidewall, said lid having a masking area adapted to engage a contact lens on said pedestal upper surface and having perforation means therein for admitting dye to the surface of a contact lens, said lid having a dye well disposed on an exterior surface thereof and above said masking area, said dye well communicating with said perforation means for receiving dye and applying said dye to said contact lens through said perforation means.

4,543,883

APPARATUS FOR PRINTING FRUSTOCONICAL ARTICLES

John P. Skrypek, Mahwah; Robert Williams, Randolph; James W. Dominico, West Paterson, and Albin Rohr, Rockaway, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 917,115, Jun. 19, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,872
Int. Cl.[4] B41F *17/18*
U.S. Cl. 101—38 A **4 Claims**



1. Apparatus for applying at least two color images to cylindrical or frustoconical articles, said apparatus including a sub-frame and a main frame; a turret mounted on said main frame for rotation about a main axis extending substantially vertical; a plurality of mandrels for supporting articles to which images are to be applied; said mandrels being mounted to said turret in angularly spaced relationship and each of said mandrels being mounted for rotation on an individual mandrel axis extending radially with respect to said main axis; indexing

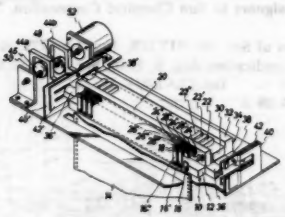
means operable to turn the turret intermittently so as to index each of said mandrels in succession at a plurality of printing stations angularly spaced around the main axis; each of said printing stations mounted on said sub-frame and including a printing roll mounted for rotation about a radially extending rotational axis, inking means for applying ink to said printing roll, an auxiliary frame on which said inking means, said printing roll and means defining said rotational axis are mounted; means defining a substantially horizontal pivot axis about which said auxiliary frame is pivotable relative to said sub-frame to align the outer surface of the printing roll for adjustment thereof to image transferring relation with respect to the outer surfaces of articles mounted on said mandrels; drive means for synchronizing rotation of said mandrels and said printing rolls with each other and with operation of said indexing means; means for bringing about relative substantially vertical adjusting movement between said main frame and said sub-frame to simultaneously adjust gap widths between the outer surfaces of said printing rolls and said mandrels; after said vertical adjusting movement said main frame and said sub-frame remaining stationary as said turret rotates as well as during rotation of said mandrels and said printing rolls; said mandrel axes extending in a common horizontal plane which is fixed in the same vertical position while said turret is turning intermittently as well as while said mandrels are indexed at said printing stations.

4,543,884

SHUTTLE TYPE LINE PRINTER

Hiroshi Kikuchi, and Kenji Sato, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,002
Claims priority, application Japan, Nov. 19, 1982, 57-201887
Int. Cl.[4] B41J *7/70*
U.S. Cl. 101—93.04 **4 Claims**



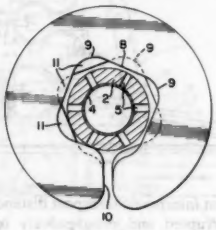
1. A shuttle type line printer which comprises a shuttle having a plurality of printing elements loaded thereon and making a reciprocating movement along the direction of the printing line, a balancer separate from the shuttle and having a mass subsequently equal to the mass of the shuttle and being driven in a direction opposite to the moving direction of the shuttle, printing hammers secured to free ends of the printing elements, a permanent magnet attracting the printing hammers and electromagnets releasing the printing hammers against the magnetic forces of the permanent magnets, wherein the printing hammers and electromagnets are loaded on the shuttle and said separate balancer comprises the permanent magnet, wherein yokes are arranged above and below the permanent magnet with small spaces being interposed therebetween, and said yokes are connected together to construct a part of the shuttle, and one end of each printing hammer is secured to one end of one of the yokes and a printing pin is projected on the other end of each printing hammer towards paper to be printed on.

4,543,885

INCREMENT CHARGE FOR A FINNED PROJECTILE

Rune Akhagen, Eskilstuna, and Arthur Jansson, Åkers Styckebruk, both of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Mar. 10, 1983, Ser. No. 474,030
Claims priority, application Sweden, Apr. 1, 1982, 8202085
Int. Cl.[4] F42B *13/26*
U.S. Cl. 102—373 **1 Claim**



1. An increment charge for a finned projectile designed to surround a cartridge tube in the projectile and to be ignited by the ignition gases from a propellant and ignition cartridge included in the cartridge tube, which comprises:

a surface on the increment charge which faces towards the cartridge tube and which is enlarged such that it exhibits a number of recesses which provide access for said ignition gases to the increment charge; and

a number of powder discs provided with holes, the discs having major surfaces facing each other and having hole edges which surround the cartridge tube;

wherein said recesses are obtained because at least one hole edge section on each powder disc is located at a greater distance from the cartridge tube than the nearest hole edge portions on adjacent powder discs;

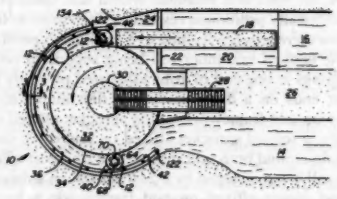
wherein the powder discs each have a horseshoe-shape, wherein the inner edge of the horseshoe-shaped which corresponds to the hole edge of the powder disc is asymmetric relative to an aperture of the horseshoe-shape, and wherein each alternate disc is turned so that the form of the hole edge is inverted in mirror fashion for each second disc.

4,543,886

AMUSEMENT RIDE INCLUDING A ROTATING LOADING TERMINAL

Robert Spieldiener, Uetikon am See; Reinhold Spieldiener, Herrliberg, and Alfons Saiko, Oberrieden, all of Switzerland, assignors to Intamin Inc., Berkeley, Calif.

Filed Mar. 9, 1983, Ser. No. 473,812
Int. Cl.[4] A63G *3/02*; B61K *1/00*
U.S. Cl. 104—53 **7 Claims**



1. An amusement ride with a loading terminal for passenger loading of independent circular vehicles comprising; at least one vehicle having an outer peripheral surface that is circular in configuration, and, a loading terminal including a revolving

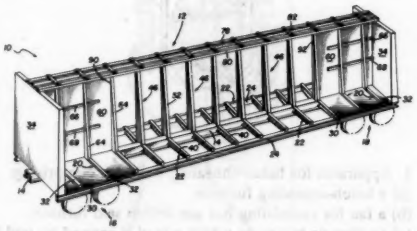
platform with an outer circular periphery, and an endless track conveyor having a vertically disposed conveying surface with a vertically disposed arcuate contact portion displaced from and concentric with the outer circular periphery, wherein said contact portion is operable at an arcuate velocity substantially equal to an arcuate velocity of an equivalent extended diameter of said platform were it extended to said arcuate contact portion of said conveyor, wherein said vehicle is simultaneously engaged by both said conveyor and platform and transported without uncontrolled roll or spin by joint action of both said platform and conveyor around a portion of a revolution of the platform, wherein said platform, vehicle and contact portion of said conveyor all have a same angular velocity.

4,543,887

CENTER BEAM RAILROAD FREIGHT CAR

William R. Baker, Northville, Mich., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Feb. 1, 1984, Ser. No. 575,874
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—355 **8 Claims**



1. A freight carrying railroad car having a predetermined length comprising:

a body supported at each end by wheel-containing truck means;

the body having a vertical center beam extending longitudinally the length of the car between bulkheads at each end of the car;

the center beam comprising a center sill, a top sill parallel to and spaced above the center sill, and a plurality of vertical spaced apart columns rigidly connected at their lower ends to the center sill and at their upper ends to the top sill; and

at each end of the car, a vertical plate extending from the center sill to the top sill, and from the respective bulkhead at that end inwardly along the center sill;

each vertical plate being joined to the center sill, top sill, bulkhead and a plurality of said columns such that opposed facing ends of said vertical plates are spaced from each other a distance of at least 60% of the length of said car between the bulkheads.

4,543,888

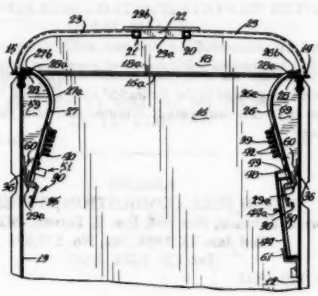
CONVERTIBLE HOPPER CAR

Richard P. Bessette, Blue Island, Ill., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Jun. 29, 1983, Ser. No. 509,817
Int. Cl.[4] B61D *39/00, 17/12*
U.S. Cl. 105—377 **20 Claims**

1. In a convertible railway hopper car for selectively shipping either those bulk cargoes which need protection from weather or those which do not, said car comprising a car body having first and second solid side walls and end walls with upper margins, a bottom wall including material discharge hopper means, and first and second parallel longitudinal beams carried on the end walls which define the sides of a narrow central hatchway through which a loading spout may fill the car with granular material, the improvement comprising in combination:

first and second sets each consisting of a plurality of wide cargo cover members each of which has parallel outer and inner longitudinal edges, and transverse edges, said outer longitudinal edges of said first and second sets being hinged, respectively, on the upper margins of the first and second side walls for movement of said cargo cover members between elevated positions in which the inner longitudinal edges of the first and second sets abut, respectively, the first and second longitudinal beams, and idle positions hanging inside the car body, and said cargo cover members in their elevated positions cooperating to form a roof which entirely covers the car body except for the hatchway;



hanger means for supporting said inner edge of each cargo cover member on a longitudinal beam, said hanger means being movable between an engaged supporting position and a disengaged position in which each cargo cover member is entirely free of any connection to a longitudinal beam so it may swing freely to its idle position;

a set of hatch elements;

hinge means mounting all of said hatch elements at the side of the hatchway adjacent the cargo cover members of the first set, for movement between an extended position in which they cooperate to entirely cover the hatchway and an open position lying atop said cargo cover members of the first set, and said hatch elements having an idle position hanging generally vertically inside the car body when the cargo cover members are in their idle position; and

securing means for fastening the hatch elements in said extended position.

4,543,889

HATCH COVER SEAL ASSEMBLY

William E. Fritz, Naperville, Ill., assignor to Dev-Mark, Inc., Naperville, Ill.

Filed Oct. 26, 1983, Ser. No. 545,669
Int. Cl.[4] B61D *17/16*
U.S. Cl. 105—377 **4 Claims**

1. A cover and seal assembly for a hatch opening of a hopper car and the like comprising;

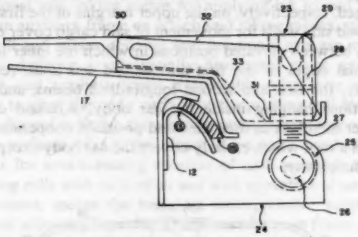
(a) a collar defining the hatch opening and providing an annular peripherial flared ring extending in an outwardly and downwardly direction with respect to said collar,

(b) a cover for the hatch opening including a depending peripheral flange adapted to overlay in spaced relation said flared ring of said collar,

(c) an annular gasket retainer mounted on the exterior of said collar below and in spaced relation to said flared ring so as to provide therebetween a gasket receiving area and,

(d) a stretchable ring gasket having an inner diameter less than the outer diameter of said flared ring of said collar and adapted to be snapped over said flared ring into said

gasket receiving area so as to be held between said flared ring and said flange with its outer peripherial edge normally disposed beyond said flared ring and in the path of movement of said flange of said cover when said cover is



moved into an overlying position with respect to said flared ring so as to be deflected into a hatch sealing position between said gasket retainer and said flange of said cover.

4,543,890

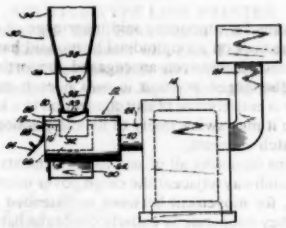
WOOD FUEL COMBUSTION SYSTEM

Theodore J. Johnson, Box 104, Rte. 1, Toivola, Mich. 49965

Filed Jan. 13, 1984, Ser. No. 570,691

Int. Cl.[4] F23K *3/00*

U.S. Cl. 110—102 **21 Claims**



1. A furnace adapted to burn wood chips and wood particles, the furnace comprising

an inner cylinder adapted to be positioned in horizontal relation and including opposite ends, and said inner cylinder housing a primary combustion area wherein wood particles are burned, one of said opposite ends comprising an air intake end,

means for supporting a quantity of wood particles and for funneling wood particles into said primary combustion area, said means for supporting including a container adapted to house a quantity of wood particles, said container including a lower end having an opening adapted to deposit wood particles into said primary combusion area of said inner cylinder,

a second cylinder including opposite ends, one of said ends surrounding said inner cylinder, said inner cylinder and said one of said ends of said second cylinder defining an air space therebetween, and the other of said opposite ends of said second cylinder defining a secondary combustion chamber,

means for separating an upper portion of said air space from a lower portion of said air space, said means for separating including a first plate extending between one side of said inner cylinder to said second cylinder and a second plate extending between an opposite side of said inner cylinder and said second cylinder, one of said lower portion of said air space and said upper portion of said air space defining an air flow passage providing for air flow to said secondary combusion chamber.

4,543,891

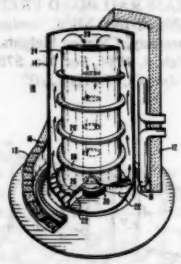
APPARATUS AND PROCESS FOR HEAT TREATMENT

William T. O'Sullivan, Rolling Meadows, Ill., and Earl C. Pace, Valparaiso, Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 12, 1984, Ser. No. 599,403

Int. Cl.[4] F23N *5/00*

U.S. Cl. 110—185 **3 Claims**



1. Apparatus for batch-annealing a charge comprising:

(a) a batch-annealing furnace;

(b) a fan for circulating hot gas within said furnace;

(c) an electric motor on which a load is exerted by said fan;

(d) a load transducer for detecting an electrical load on said motor and capable of generating a load signal;

(e) a load change detector responsive to said load signal and capable of generating a load change signal;

(f) a frequency reference integrator responsive to said load change signal and capable of generating, storing and changing a reference signal responsive to said load change signal; and

(g) an adjustable frequency drive responsive to said reference signal and capable of supplying a varying frequency alternating current power to said motor.

4,543,892

CONDENSATE HANDLING MEANS FOR CONDENSING FURNACE

Ronald S. Tomlinson, Nashville, and Bryan O. Trent, Smyra, both of Tenn., assignors to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Nov. 17, 1983, Ser. No. 553,744

Int. Cl.[4] F23J *15/00*; F01M *3/15*; F17D *1/00*; B01D *35/00*

U.S. Cl. 110—203 **12 Claims**

1. In a gas-fired furnace having an outlet for discharging products of combustion condensate from the furnace, the improvement comprising:

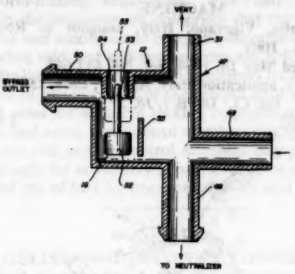
neutralizing means;

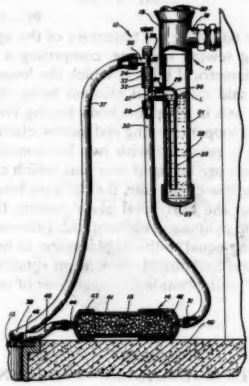
a first conduit conducting condensate from said outlet to the neutralizing means;

a second conduit for conducting neutralized condensate from said neutralizing means to a drainage access spaced therefrom, said first conduit, neutralizing means, and second conduit defining a first condensate flow path; and

a third conduit for delivering condensate from said outlet to a drain position spaced from said neutralizing means in a

second flow path fully independently of said first condensate flow path and only in the event condensate flow





through said first flow path is limited by obstruction in any portion thereof to below a preselected rate of flow.

4,543,893

LINING BRICK

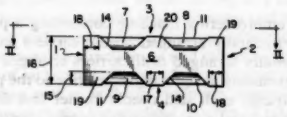
Manfred Künnecke, Taunusstein, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,364

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316372

Int. Cl.[4] F23M *5/02*

U.S. Cl. 110—338 **10 Claims**



1. In a lining brick for use in forming refractory linings for receptacles such as furnaces, particularly rotary kilns, said brick being of the type comprising a hot side surface adapted to be directed toward the interior of a furnace, a planar shell side surface opposite said hot side surface and adapted to contact the shell of the furnace, a first pair of spaced opposite lateral sides extending between said hot side and shell side surfaces, a second pair of spaced opposite lateral sides extending between sid hot side and shell side surfaces and converging between said shell side and hot side surfaces, and recesses opening onto said shell side surface, the improvement wherein:

said recesses are formed in spaced opposite lateral sides of one of said pairs only;

each said recess has a first side opening onto said shell side surface and a second side opening onto the respective lateral side of said one pair of spaced opposite lateral sides;

each said recess is defined by a surface portion having a first end terminating at said shell side surface and a second end terminating at said respective lateral side; and

the total area of said first ends of all of said recesses that lie in the plane of said shell side surface is less than the area of said shell side surface.

4,543,894

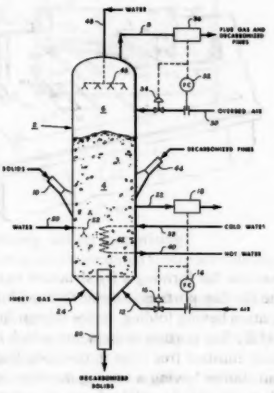
PROCESS FOR STAGED COMBUSTION OF RETORTED OIL SHALE

Charles F. Griswold, Brea, and Ben A. Christolini, Jr., Anaheim, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 17, 1983, Ser. No. 495,505

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **34 Claims**



1. A process for combusting retorted shale particles of a size suitable for fluidization, said shale particles containing materials, which process comprises:

(1) combusting a substantial proportion of the combustible material contained within said shale particles by staged combustion, said staged combustion comprising:

(a) combusting said particles in a first-stage combustion zone, the particles being maintained as a fluidized bed by a fluidizing gas stream comprising oxygen introduced into said first-stage combustion zone at a rate sufficient to maintain said particles as a fluidized bed therein while providing a substoichiometric quantity of oxygen for combustion of said combustible material in said first-stage combustion zone;

(b) controlling the concentration of gaseous ammonia in said first stage combustion zone in the range between about 5 and 100 ppm by volume of the gases produced in the first stage combustion zone;

(c) combusting off-gases from said first-stage combustion zone in said second-stage combustion zone, with combustion being maintained by a gas stream comprising oxygen introduced into said second-stage combustion zone, said combustion being under conditions sufficient to produce a flue gas of relatively low carbon monoxide, nitrogen oxides, and sulfur oxides content;

(2) discharging said flue gas from said second-stage combustion zone; and

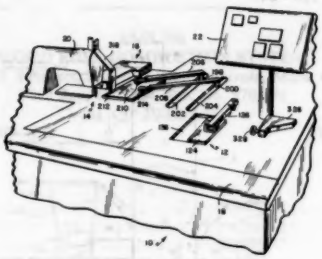
(3) discharging crushed particles in a relatively decarbonized condition from said first-stage combustion zone.

4,543,895

MACHINE FOR MAKING A FLY STRUCTURE

Louis A. Tocchio, Abington, Mass., assignor to The Reece Corporation, Waltham, Mass.

Filed Jun. 4, 1984, Ser. No. 616,821
Int. Cl.[4] D05B 3/12
U.S. Cl. 112—104 26 Claims



1. A machine for forming a fly structure in a garment panel having the fly flap portion integral therewith comprising,

a first station having folding means thereat for forming a fold in said fly flap portion along a line which is to become the exposed finished free edge in the completed fly structure,

a second station having a sewing machine located thereat,

a third station having slide fastener stringer feeding and positioning means thereat, and

transfer means for sequentially transferring the folded garment panel from said first station to said second station and through said sewing machine for stitching said fold, then from said second station to said third station for placement of a slide fastener stringer thereon, then transferring the garment panel back to said second station and again through said sewing machine to form a second line of stitching to secure said slide fastener stringer to said garment panel.

22. A machine for forming a fly structure in a garment panel having the fly flap portion integral therewith comprising,

folding means for folding said fly flap portion under said garment panel along a predetermined line,

said folding means having first and second members movable laterally toward each other to fold said fly flap portion under said garment panel,

each of said members having an upper lip and a lower lip extending in the direction of the other member and defining a longitudinal opening facing the opposite member, and

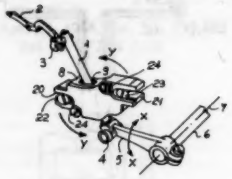
the upper and lower lips of one member being vertically offset from the upper and lower lips of the other member whereby the upper lip of one member will enter the opening in the other member while the lower lip of the said other member will enter the opening in said one member.

4,543,896

DEVICE FOR ADJUSTING THE TRAJECTORY OF THE UPPER LOOPER IN AN OVERLOCKING SEWING MACHINE

Gennaro DeSantis, Vigevano, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed May 18, 1984, Ser. No. 611,641
Claims priority, application Italy, Apr. 17, 1984, 23703/83[U]
Int. Cl.[4] D05B 1/18, 57/06
U.S. Cl. 112—162 2 Claims



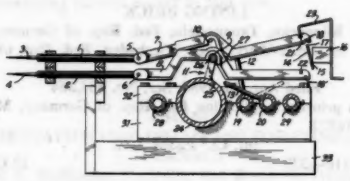
1. A device for adjusting the trajectory of the upper looper in an overlocking sewing machine, comprising a cylindrical element with a diametrical bore in which the looper carrying rod is disposed, said cylindrical element being disposed for rocking about an axis in a support body having two opposing slots in which said looper carrying rod moves, characterized in that said support is provided with two horizontal rectilinear slots in which there are engaged two pins which can be fixed in their turn to the machine frame, the slot axes being at different distances from the horizontal plane passing through the rocking axis of said cylindrical element, the difference between said distances being equal to the displacement in height of the rocking axis of said cylindrical element on rotating said support through 180° with positional change-over of said horizontal slots.

4,543,897

SHUTTLE EMBROIDERING MACHINE

August Heinzle, Altweg 9, A-6844 Altach, Austria

Filed Mar. 28, 1983, Ser. No. 479,214
Claims priority, application Austria, Mar. 29, 1982, 1200/82
Int. Cl.[4] D05B 3/12
U.S. Cl. 112—221 28 Claims



1. Shuttle embroidering machine comprising a plurality of elongated horizontally arranged needle carriers and of elongated horizontally arranged drill carriers arranged to be displaced approximately at right angles relative to the plane of an embroidery frame, each said needle carrier and drill carrier having a first end and a second end, a needle inserted into the first end of each said needle carrier, a drill inserted into the first end of each said drill carrier, a generally horizontally extending first arm attached to the second end of each said needle carrier, a generally horizontally extending second arm attached to the second end of each said drill carrier, each of said first and second arms being pivotally displaceable about a horizontal axis, each of said first and second arms having a first end and a second end with said first ends of said first and second arms being connected to the second ends of the respective said needle carriers and drill carriers, a drive element for

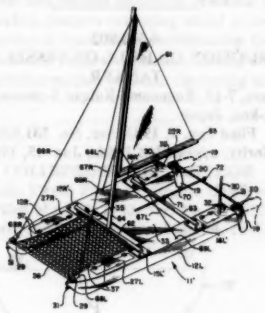
the operative displacement of said needle carriers and drill carriers, said first and second arms being shaped for selective and form-locking engagement with said drive element, wherein the improvement comprises that the second ends of said first and second arms being displaceable along a vertical path when said first and second arms are pivotally displaced, individually controllable locking members located in the vertical path of displacement of the second ends of said first and second arms for selective locking engagement with said first and second arms, first control members engageable with said first arms and second control members engageable with said second arms for selectively pivoting said first and second arms into and out of locking engagement with said locking arms.

4,543,898

TWO HULLED MOTOR TO SAIL CONVERTIBLE BOAT

Antonio J. Castilla, Rte. 1, 18A, Rose Garden Estates, McKinney, Tex. 75069

Filed Oct. 11, 1983, Ser. No. 540,536
Int. Cl.⁴ B63B *1/12*
U.S. Cl. 114—39 **12 Claims**



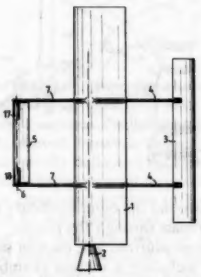
1. A sport boat convertible between outboard motor drive and sail drive with spaced hulls comprising: twin hulls each having top mounting pad means; hull spacing structure means with mounting pad means on each side for mounting connection with said top mounting pad means on each of said twin hull means whereby the twin hulls are held generally in spaced relation when the mounting pad means of said hull spacing structure means are mounting connected to respective top mounting pad means of the said twin hulls; and drive propulsion means mounted on said hull spacing structure means; a boat steering rudder is pivotally mounted on the rear of each of said twin hulls; and a steering transverse rod interconnects the rudders to turn rudders in unison around their pivotal mountings with transverse steering movement imparted to said steering transverse rod; wherein in the outboard motor drive conversion said hull spacing structure means is a passenger user mount and outboard motor mount having fore and aft arcuate frame sections spanning the space between said twin hulls and terminating with a mounting pad at opposite ends of said fore and aft arcuate frame sections as said mounting pad means; and each hull of said twin hulls has a fore top mounting pad and an aft mounting pad as said top mounting means longitudinally spaced to match the longitudinal spacing of said fore and aft arcuate frame section mounting pads for mounting connection thereto; and wherein in the sail drive conversion said hull spacing structure means includes at least two straight transverse members a fore and aft transverse member with mount pads on opposite ends of said fore and aft transverse members that mount, respectively, on said fore top mounting pad and said aft mounting pad of said top mounting pad means on said twin hulls in the sail drive conversion; and wherein a sail mast is mounted on and extends vertically from said fore transverse member; and wherein said hull spacing structure means in the outboard motor drive conversion includes a longitudinal frame structure interconnecting said fore and aft arcuate frame members and extended to the rear with a motor mount for mounting an outboard motor; and wherein said fore and aft arcuate frame members and said longitudinal frame structure are enclosed in a molded plastic housing.

4,543,899

SELF-TRIMMING SAILSET

John G. Walker, 31 Abbeyfields Close, Netley Abbey, Hampshire, England

PCT No. PCT/GB82/00290, § 371 Date Jun. 13, 1983, § 102(e) Date Jun. 13, 1983, PCT Pub. No. WO83/01427, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 11, 1982, Ser. No. 509,445
Claims priority, application United Kingdom, Oct. 13, 1981, 8130874
Int. Cl.⁴ B63H *9/04*
U.S. Cl. 114—39 **4 Claims**



1. A self-trimming sail set comprising:
an upright principal sail mounted freely for rotation about an upright axis;
a tail vane settable for controlling the angle of attack of the principal sail to the wind;
an auxiliary vane mounted in a position normally upstream of the principal sail; and
control means for setting the auxiliary vane to oppose the moment of the principal sail about its said axis when the tail vane is set to cause the principal sail to move towards a stalled condition, said control means being operable to allow said auxiliary vane to weathercock when said tail vane is set for a normal non-stalling condition of said principal sail.

4,543,900

SHIPBOARD ICE LUBRICATION SYSTEM AND JET PUMP FOR USE THEREIN

Charles M. Aker, Santa Fe Springs, Calif., assignor to Omnithruster, Inc., Santa Fe Springs, Calif.

PCT No. PCT/US83/00813, § 371 Date Jan. 23, 1984, § 102(e) Date Jan. 23, 1984, PCT Pub. No. WO83/04232, PCT Pub. Date Dec. 8, 1983
Continuation-in-part of Ser. No. 380,522, May 21, 1982. This PCT application May 20, 1983, Ser. No. 590,593
Int. Cl.⁴ B63B *1/38*
U.S. Cl. 114—40 **10 Claims**

1. In combination with a ship having a hull and a thruster system including a pipe assembly having an inlet communicating through said hull with the sea and pump means for drawing water through said inlet and selectively discharging said water through first and/or second thruster outlets respectively in the port and starboard sides of said hull, an ice lubrication system comprising:
a first plurality of discharge openings formed in the star-

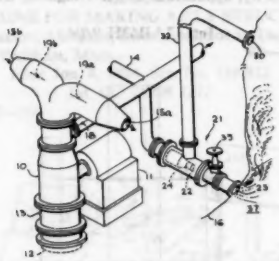
board side of said hull spaced from one another extending toward the stern from the bow portion of said hull;

a second plurality of discharge openings formed in the port side of said hull spaced from one another extending toward the stern from the bow portion of said hull;

a plurality of gas/water mixing devices, each including a converging nozzle mounted adjacent to a different one of said discharge openings;

a conduit having an intake for receiving water from said pump means and an outlet connected to each of said converging nozzles;

each of said nozzles including at least one vane means mounted on the inner surface of the nozzle projecting into the flow path therethrough and oriented to impart a swirl



component around the outer boundary of a water column flowing therepast through the nozzle;

a source of nonpressurized gas; each of said gas/water mixing devices including a suction chamber coupled to the nozzle thereof downstream therefrom for creating a mixture of gas and water, each of said chambers having a first inlet communicating with said gas source and second inlet means upstream from said first inlet for receiving said water column exiting from the nozzle coupled thereto whereby said column creates a suction to pull gas through said first inlet into said chamber to entrain said gas in said column outer boundary, and outlet means for discharging said mixture of water and entrained gas through the discharge opening adjacent thereto.

4,543,901

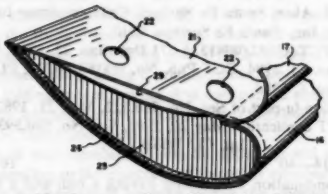
SURFACE EFFECT SHIP AIR CUSHION SEAL SYSTEM

Robert A. Stringer, Slidell, La., assignor to Textron, Inc., Providence, R.I.

Continuation of Ser. No. 548,913, Nov. 7, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 703,032

Int. Cl.[4] B63B *1/38*

U.S. Cl. 114—67 A **6 Claims**



1. In combination, a surface effect ship of the type having relatively spaced rigid sidehull structures with generally parallel inboard sides thereof extending beneath the main body of the ship into and below the water line of the ship to partially define an air cushion space beneath said ship, and an air cushion seal system comprising a stack of inflatable lobes fixed to said ship so as to extend between and have opposite ends cooperating with said inboard sides to assist in sealing said air cushion space;

said inflatable lobes being primarily formed of sheets of flexible air passage-impervious material, wherein a lower most of said lobes includes a lower loop portion having its aft end rolled upwardly and forwardly for attachment to a lower loop portion of a next above lobe;

partial closure sheets formed of flexible and substantially air passage-impervious material having marginal edges right-angle folded and attached to said opposite ends of said lowermost of said lobes only around said lower loop portion while being free from attachment to said lower loop portion of said next above lobe so as to partially close said opposite ends of said lowermost of said lobes against water ingress while providing a degree of configuration stabilization to said opposite ends of said lowermost of said lobes against operationally encountered buffeting forces; and

said closure sheets are inset relative to said opposite ends of said lowermost of said lobes so as to avoid frictional contacts thereof with said inboard sides.

4,543,902

CONSTRUCTION OF HULL OF VESSEL SUCH AS TANKER

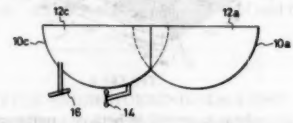
Osamu Mihara, 7-15, Kugenuma-Kaigan 3-chome, Fujisawa-shi, Kanagawa-ken, Japan

Filed Jun. 7, 1983, Ser. No. 501,936

Claims priority, application Japan, Jun. 15, 1982, 57-101293

Int. Cl.[4] B63B *25/12*

U.S. Cl. 114—74 R **4 Claims**



1. A vessel such as a tanker for transporting large volumes of material great distances over the high seas, said vessel comprising a hull and means integral with said hull for propelling said hull great distances over the surface of the seas, said hull including three hemispheres floatable on the surface of the seas and constructed and interconnected to withstand the waves of the high seas, at least two of said hemispheres having equal diameters and being located at the stern of the vessel, the remaining hemisphere being located at the bow of the vessel, said three hemispheres being rigidly interconnected such that lines between the centers of each pair of hemispheres are each shorter than the sum of the radii of the pair of hemispheres and lines between the respective centers of said two hemispheres of equal diameter at the stern of the vessel and the center of the third hemisphere at the bow of the vessel constitute two equal sides of a triangle, said triangle lying in a plane no lower than the water line of said hull.

4,543,903

DOCK CONNECTOR AND STABILIZER

Donald J. Kramer, Rte. 1, Box 26-A, Wilbur, Wash. 99185

Filed Nov. 1, 1982, Ser. No. 438,112

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—263 **7 Claims**

1. A dock connector for securing a first dock to a second dock, comprising:

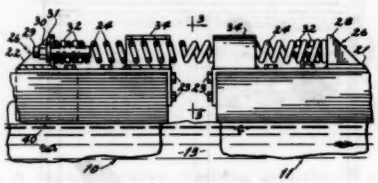
first and second mounting brackets having planar surfaces adapted for attachment to the first and second docks, respectively;

first and second spring brackets rigidly connected to said

first and second mounting brackets and having upstanding surfaces thereon;

a helical extension compression spring spanning between and connecting said first and second spring brackets;

first and second spring connection means for loosely engaging and connecting said spring to said first and second spring brackets, respectively;



first and second tubular deflection limiters rigidly connected to said first and second mounting brackets, respectively; said deflection limiters extending about at least a portion of said spring in loose fitting relationship thereto, to restrict lateral and vertical deflection thereof while allowing limited relative motion between the spring and deflection limiters.

4,543,904

COLLAPSIBLE ARM ANCHOR

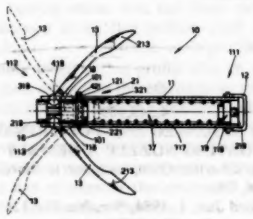
Francesco Puoti, Vicolo Posta 52, Reggio Calabria, Italy

Filed Mar. 23, 1983, Ser. No. 477,912

Claims priority, application Italy, Mar. 24, 1982, 83346 A/82

Int. Cl.⁴ B63B *21/34*

U.S. Cl. 114—294 **2 Claims**



1. A self-clearing anchor comprising a stem having an axial cavity, a plurality of anchor arms pivoted to said stem adjacent to one end of said stem such that said anchor arms have control ends protruding into said cavity and free ends spaced from said stem, an anchor ring rigid with said stem at another end thereof for connection to an anchor pulling cable, a slidable body arranged within said cavity of said stem, and resilient means in said cavity for urging said slidable body against said control ends of said anchor arms, said slidable body and said control ends having mutually cooperating surfaces in permanent engagement with each other, wherein the force of said resilient means against said control ends causes said anchor arms to assume an operative position in which said anchor arms are spread out, wherein a pulling force exerted on said anchor ring causes snagged anchor arms to pivot into a position protruding beyond said one end of said stem against the force of said resilient means, and wherein said slidable body is a cylindrical body having a threaded axial bore and wherein the anchor further comprises a flange having an axial threaded shank threadable into said threaded bore, said flange defining with said body an axially adjustable annular seat for receiving said control ends of said anchor arms.

4,543,905

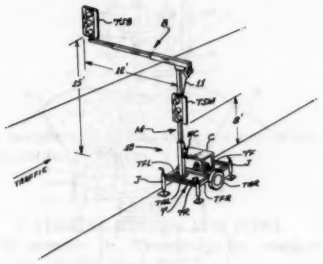
PORTABLE TRAFFIC SIGNALLING APPARATUS AND METHODS THEREFOR

John D. McKenney, South Laguna, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 2, 1983, Ser. No. 548,205

Int. Cl.⁴ E01F *9/10*

U.S. Cl. 116—63 P **22 Claims**



1. A portable traffic signal comprising a supporting structure of the wheeled trailer type, telescopic mast means having a plurality of telescopic sections slidable inside another section to be controllably moved between telescopically extended positions and telescopically collapsed positions, one end of the telescopic mast means being secured to said supporting structure to permit the remaining sections to be extendable and collapsible relative to said supporting structure, means for releasably securing the telescopic sections in either the extended or collapsed positions, telescopic boom means having a plurality of telescopic sections slidable inside another section to be controllably moved between extended positions and collapsed positions, one end of the telescopic boom means being pivotally secured adjacent to the free end of said mast means to permit the telescopic boom sections to be extendable and collapsible in unison with the movements of the telescopic sections for said mast means, the free end of the boom means being adapted to mount a traffic signal thereon, means on said supporting structure for releasably securing the free end of said boom means, and control means coupled to said mast means and said boom means to selectively move said plurality of telescopic sections between extended and collapsed positions in unison when said boom means is secured to said boom securing means.

4,543,906

DEVICE FOR COATING PARTICLES, PARTICULARLY DRUGS IN THE FORM OF PARTICLES, SUCH AS TABLETS

Werner Glatt, Binzen, and Erwin Grab, Rümmingen, both of Fed. Rep. of Germany, assignors to Glatt Maschinen- Und Apparatebau AG, Pratteln, Switzerland

PCT No. PCT/CH82/00071, § 371 Date Jan. 21, 1983, § 102(e) Date Jan. 21, 1983, PCT Pub. No. WO82/03972, PCT Pub. Date Nov. 25, 1982

PCT Filed May 21, 1982, Ser. No. 463,882

Claims priority, application Switzerland, May 22, 1981, 3346/81; May 22, 1981, 3347/81

Int. Cl.⁴ A23G *3/26;* B05L *5/00*

U.S. Cl. 178—1.7 **35 Claims**

1. Apparatus for coating particles, particularly pharmaceuticals, such as tablets, said apparatus comprising:

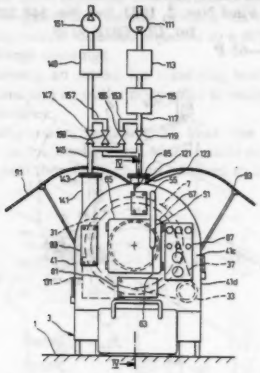
a support;

a drum positioned on said support for rotation about an axis, said drum having a wall at least partly perforated;

a gas transmission shoe which is held during operation by said support, said shoe lying against said wall part so that gas may flow through said wall; and

a housing encompassing and sealing said drum, said housing

including an opening on both sides of a vertical plane passing through said axis of said drum, a hinged cover for closing off each of said openings, each of said hinged



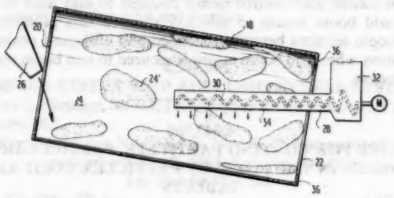
covers mounted for opening and closing around a pivot located on the upper side of each hinged cover, and said transmission shoe being movable away from said drum and outside of said housing.

4,543,907

APPARATUS FOR SEASONING SNACK FOOD ITEMS

David P. Fowler, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 22, 1984, Ser. No. 623,704
Int. Cl.[4] B05C *19/00*
U.S. Cl. 118—19 **1 Claim**



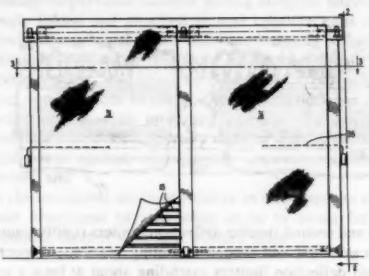
1. A rotating tumbler drum for use in a snack food seasoning apparatus in which seasoning material is dropped onto a tumbling mass of fragile, three-dimensional, non-uniform snack food items, the rotating tumbler drum comprising a drum having an opening at one end through which snack food items can be introduced and an opening at the other end through which snack food items can be discharged and through which means extend into the interior of the drum for distributing the seasoning material, with improvements for providing random movement of a tumbling mass of the snack food items in which the interior wall surface of the drum comprises, on its interior surface along at least a portion of its length, a plurality of randomly sized and positioned wall segments having significantly differing coefficients of friction with respect to the remaining portion of the interior surface of the drum, so that rotation of the drum causes the snack food items within the drum to tumble in a random manner while seasoning material is dropped onto them.

4,543,908

MATERIAL FOR FILTERING SPRAY COATING PARTICLES FROM AIR

Arvid C. Walberg, 4443 St. Tropez Dr., Lisle, Ill. 60532

Filed Sep. 29, 1982, Ser. No. 426,823
Int. Cl.[4] B05B *1/28, 15/04*
U.S. Cl. 118—326 **1 Claim**



1. A spray booth comprising:

(a) a moveable wall having a continuous flexible mat of closely spaced fibers forming a multiplicity of cells,

(b) a multiplicity of randomly positioned fibers extending from the mat into each said cell with a multiplicity of random sub-cells,

(c) a conductive coating covering said mat and randomly positioned fibers,

(d) a conductive backup structure supporting said continuous flexible mat, and

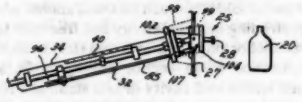
(e) means connected to said continuous mat to electrically ground said continuous flexible mat and said conductive backup structure.

4,543,909

EXTERIORLY MOUNTED AND POSITIONABLE SPRAY COATING NOZZLE ASSEMBLY

John Sharpless, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jun. 1, 1984, Ser. No. 616,124
Int. Cl.[4] B05B *15/06*
U.S. Cl. 118—326 **10 Claims**



1. A spray nozzle assembly for spray coating workpieces in a cabinet with a coating material, comprising:

a spray nozzle through which the coating material is sprayed;

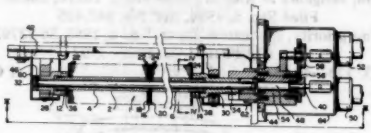
nozzle support means for supporting said spray nozzle, said nozzle support means adapted to be mounted exteriorly of the cabinet and being movable relative to the cabinet to position said spray nozzle with respect to workpiece; and

nozzle positioning means mounted to said nozzle support means for positioning said spray nozzle relative to said nozzle support means, said nozzle positioning means being operable to position said spray nozzle with respect to a workpiece independently of said nozzle support means.

4,543,910
VAPOR DEPOSITION REGULATING APPARATUS

Jerzy A. Dobrowolski, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 15, 1984, Ser. No. 660,969
Claims priority, application Canada, Oct. 17, 1983, 439085
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—665 4 Claims



1. A vapour deposition regulating apparatus for continuously regulating the deposition thickness from vapour as it is being vacuum deposited across and progressively along one side of a substrate, comprising:

(a) a central shaft,

(b) at least two hollow shafts rotatably supported in end-to-end relation on an intermediate lengthwise portion of the central shaft, each hollow shaft having two substantially parallel flats on opposite sides thereof and an externally screw threaded end portion adjacent an end of the central shaft,

(c) disc bearing means on the central shaft and separating the adjacent ends of the hollow shafts,

(d) for each hollow shaft, a fixed, profile disc thereon, each fixed profile disc being adjacent the disc bearing means and having substantially the same external dimensions as the disc bearing means,

(e) for each hollow shaft, a series of similarly shaped profile discs having substantially the same external dimensions as the disc bearing means and the fixed, profile discs and being disposed along that hollow shaft in side-by-side relationship to form a profile, each profile disc having a slot slidably locating that profile disc on the flats of the hollow shaft extending therethrough so that each profile disc is displaceable to form a desired masking profile,

(f) for each hollow shaft, a screw threaded sleeve having a bore portion located on the central shaft and a larger screw threaded portion bore portion screwed on to the threaded end portion of the associated hollow shaft to secure the profile discs thereon,

(g) driving means coupled to the screw threaded sleeves for rotating each hollow shaft independently, and

(h) mounting means for rotatably mounting the screw threaded sleeves in a vacuum deposition apparatus.

4,543,911
MITTENS FOR CANINES

Tina Marshall, 144-19 38th Ave., Flushing, N.Y. 11354, assignor to Bruce Marshall and Tina Marshall, both of Flushing, N.Y.

Continuation-in-part of Ser. No. 371,853, Apr. 26, 1982, Pat. No. 4,457,261. This application Jun. 25, 1984, Ser. No. 623,986
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.
Int. Cl.[4] A43B *3/00*
U.S. Cl. 119—1 18 Claims

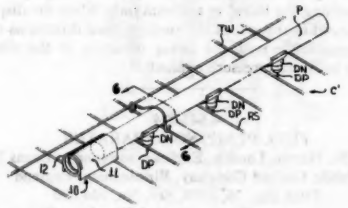
1. A mitten for canines which comprises a tube tapered-off at least near a closed bottom and having attached around an open top fastening means adapted to decrease the diameter of the open top for securing said top to the canine, said tube being made of a light-weight, waterproof, flexible latex material having a soft inside surface and an anti-slip outside surface provided both at the bottom of the mitten and substantially

around the periphery of at least the lower part of the outside surface adjacent to the bottom.

4,543,912
WATERING SYSTEM FOR FOWL

Frederick W. Steudler, Jr., Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Filed Jan. 10, 1984, Ser. No. 569,761
Int. Cl.[4] A01K *39/02*
U.S. Cl. 119—18 10 Claims



1. A fluid flow orientation system comprising a pipe having axially opposite end portions and a passage therethrough through which fluid is adapted to flow along a first path of travel, at least one opening in said pipe having an axis disposed in transverse relationship to said passage for diverting the fluid flow from said first path of travel to a second path of travel at a predtermined angle to said first path of travel, a coupling, means fixing said coupling to one of said pipe end portions and said coupling having means for defining a uniplanar locating surface exteriorly of said coupling at a point said first path of travel which is normal to a reference line passing through said one opening axis and normal to a line tangent to the opening whereby upon orienting said coupling such that said uniplanar locating surface rests upon a reference surface, said second path of travel is likewise automatically oriented in a plane at a desired angle to the reference surface established by the fixed relationship of said coupling and said one pipe end portion.

4,543,913
LIQUID DISPENSER AND GROOMING BRUSH FOR ANIMALS

Charles N. Wilkeson, 114 Colina Pl., Ormond Beach, Fla. 32074

Filed Aug. 20, 1984, Ser. No. 642,507
Int. Cl.[4] A01K *13/00*
U.S. Cl. 119—85 6 Claims

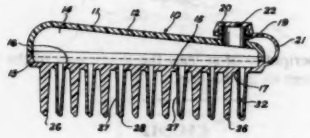
1. A brush-type dispenser for applying a plurality of streams of a free-flowing liquid between the hairs of and directly to the skin of an animal when the dispenser is moved in at least one of two opposed directions, comprising in combination:

a generally flexible housing having a flat, bottom wall including an inner and an outer surface and defining a hollow, resilient chamber in which the liquid is contained;

a first array of a plurality of generally flexible, solid members

arranged in spaced relation along spaced rows parallel to the directions of movement of the dispenser, each member of the first array extending normally from the bottom wall and having a free end terminating in a common flat plane for combing and separating the hair of the animal as the dispenser is moved in either of the two opposed directions with sufficient pressure applied thereto to maintain the free ends of the members in contact with the skin of the animal; and

a second array of a plurality of generally flexible, hollow members arranged in spaced relation to each other be-



tween and in alternate rows of the members of the first array, each member of the second array extending normally from the bottom wall, communicating with the chamber and having a free end terminating in the common plane, each free end being provided with a self-sealing slit facing one of the two opposed directions for normally retaining the liquid in the chamber and being opened for dispensing the liquid in a stream only when the dispenser is moved in the one of the two opposed directions that is in accordance with the facing direction of the slits and with sufficient pressure applied

---

4,543,914

FUEL PUMPING APPARATUS

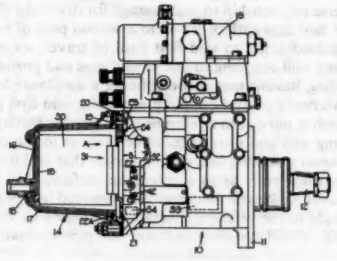
Kenneth M. Harris, London, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Sep. 26, 1984, Ser. No. 654,690

Claims priority, application United Kingdom, Oct. 1, 1983, 8326354

Int. Cl.[4] F02M *5/10*; F28D *15/00*

U.S. Cl. 123—41.31 **15 Claims**



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a fuel pump including a fuel pump body, solenoid operated means for controlling the output of the pump, an electronic control circuit for controlling the flow of electric current in the solenoid, an inner casing adapted to be mounted on the body of the fuel pump, said electronic circuit being mounted in said inner casing, an outer casing surrounding said inner casing and defining a space therebetween, a fuel inlet on said outer casing, said fuel inlet communicating with said space, a fuel outlet from said space connected to the fuel inlet of the pump and a heat insulating and electrically insulating plate serving to close an open end of the inner casing, said plate being interposed between a peripheral flange on the inner casing and the body of the pump, an insert supported within an aperture in said plate, said insert defining the fuel outlet from said space, and a pair of sealing means located between said insert and the flange of said inner casing and the body respectively.

4,543,915

COOLING FAN FOR RECOIL STARTER TYPE ENGINE

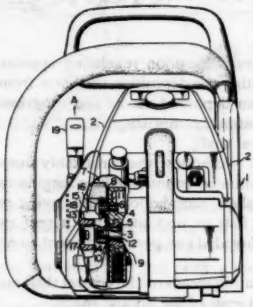
Akira Nagashima, Kawasaki, and Toshio Taomo, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,425

Claims priority, application Japan, Sep. 6, 1983, 58-137933[U]

Int. Cl.[4] F01P *1/02*; F02N *3/02*

U.S. Cl. 123—41.65 **1 Claim**



1. A cooling fan for a recoil starter type engine comprising:

a columnar projection formed at a front face of a magneto rotor of an ignition system mounted to a rotary shaft of an internal combustion engine;

a cylindrical portion for receiving said columnar projection and engaging an outer peripheral surface of the projection formed at a cooling impeller mounted to the front face of the magneto rotor;

a keep plate for forcing a central portion of the cooling impeller against the magneto rotor; and

a claw member connected to said projection and engaging a recoil starter to force the cylindrical portion of the cooling impeller against the magneto rotor whereby the cooling impeller can be secured to the magneto rotor.

4,543,916

INDUCED CONTROLLED DETONATION INTERNAL COMBUSTION ENGINE

Vincent L. Giorno, 4328 N. Keeler Ave., Chicago, Ill. 60641

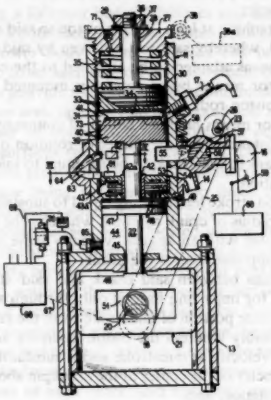
Filed Nov. 25, 1983, Ser. No. 555,157

Int. Cl.[4] F02B *75/04*

U.S. Cl. 123—48 A **9 Claims**

1. An unscavenged two-stroke cycle internal combustion engine capable of efficient operation under controlled detonating high temperature and pressure conditions with a lean fuel-air mixture which comprises a cylinder, a power piston reciprocating in the cylinder, means providing a closed chamber coaxially aligned with and separated from said cylinder, a bounce piston slidable in said closed chamber, a piston rod fixedly connecting said power piston and said bounce piston, a fuel intake port discharging the fuel-air mixture into said chamber on the downstroke of the bounce piston, valved ports feeding the fuel-air mixture to the cylinder below the power piston on the upstroke of the bounce piston, an exhaust port in the cylinder opened by the power piston near the bottom of its stroke, fuel transfer ports in the cylinder conveying the fuel-air mixture from under to above the power piston at the bottom of the power piston stroke, a valve in the intake port opening only on the ascending stroke of the power piston, a valve in the

exhaust port opening only during a portion of the stroke of the power piston clearing the port to retain residual gases in the



cylinder, and said fuel transfer ports being constructed and arranged to atomize fuel flowing therethrough.

4,543,917

INTERNAL COMBUSTION ENGINE

James M. Lapeyre, 13 Richmond Pl., New Orleans, La. 70151

Continuation-in-part of Ser. No. 237,667, Feb. 24, 1981, , Ser. No. 97,955, Nov. 28, 1979, abandoned, and Ser. No. 890,980, Mar. 28, 1978, abandoned. This application Dec. 3, 1982, Ser. No. 446,702

Int. Cl.[4] F02B *25/08*

U.S. Cl. 123—51 B **4 Claims**

1. A two cycle internal combustion diesel engine comprising in combination:

(a) a minimum of two side by side spaced apart axially parallel cylinders,

(b) a hollow guideway positioned between and parallel to said spaced apart cylinders,

(c) one variable volume combustion chamber contained within each of said cylinders,

(d) air intake porting located in each cylinder wall at a first end of said combustion chamber,

(e) exhaust porting located in each cylinder wall at a second end of said combustion chamber,

(f) air compressing means comprising a turbocharger having a turbine driven compressor supplying air to said air intake porting in each cylinder wall at the first end of said combustion chamber and the exhaust gases issuing from said exhaust portion in each cylinder wall at the second end of said combustion chamber driving said turbine,

(g) means for delivering fuel into said cylinders approximately midway of the length of said combustion chamber, when said combustion chamber is at its approximate minimum volume, said means including a pre-combustion chamber common to and in communication with each combustion chamber of each of said cylinders, said pre-combustion chamber being positioned outside of the plane of the axes of said cylinders,

(h) one cylindrical single headed pressure sealing valveless air intake controlling piston coaxial with and slidably mounted within each of said cylinders, said piston having its head end facing the combustion chamber and its connector end facing a first non-combustion end of said cylinder, said piston being adapted to open and close said air intake porting as it slides past said air intake porting,

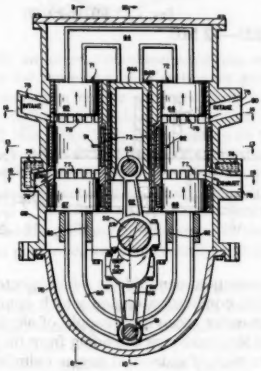
(i) a rigid non-pivotal piston bridging means spanning from piston axis to piston axis of said air intake controlling pistons,

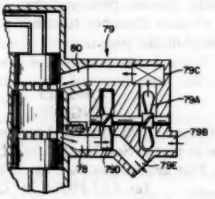
(j) dual rigid and operationally non-pivotal piston connector means extending from said piston bridging means, said piston connector means being adapted to link said piston ridging means with said air intake controlling pistons at said pistons' connector ends,

(k) bridge guide means extending from said piston bridging means into said hollow guideway, said bridge guide means terminating in a connecting rod pivot means,

(l) one cylindrical single headed pressure sealing valveless exhaust controlling piston coaxial with and slidably mounted within each of said cylinders, said piston having its head end facing said combustion chamber and its connector end facing a second non-combustion end of said cylinder, said piston being adapted to open and close said exhaust porting as it slides past said exhaust porting,

(m) a second rigid non-pivotal piston bridging means spanning from piston axis to piston axis of said exhaust controlling pistons,





(n) second dual rigid and operationally non-pivotal connector means extending from said second piston bridging means, said second piston connector means being adapted to link said second piston bridging means with said exhaust controlling pistons at said pistons' connector ends,

(o) a single crankshaft located between said parallel axes of said cylinders and between the two piston bridging means, the axis of said crankshaft being at right angles to the plane of said cylinders' parallel axis,

(p) at least two connecting rods between the two said piston ridging means, one of said connecting rods being connected to pivot means of said brige guide means and to said crankshaft, and a second connecting rod connected to said second piston bridging means and to said crankshaft,

(q) said connections to said crankshaft being made to angularly spaced cranks carried by said single crankshaft, said angular spacing of said cranks being such that as the

crankshaft rotates through 360°, the two piston bridging means and their respectively connected pistons are forced to move in opposite directions, the two air intake controlling pistons being reciprocated in unison and the two exhaust controlling pistons likewise being reciprocated in unison and wherein said air intake controlling pistons are forced to lag behind said exhaust controlling pistons in such a manner that said exhaust porting is forced to open prior to the opening of said air intake porting and said exhaust porting is forced to close prior to the closing of said air intake porting.

4,543,918

INTAKE MANIFOLD FOR AN INTERNAL COMBUSTION ENGINE

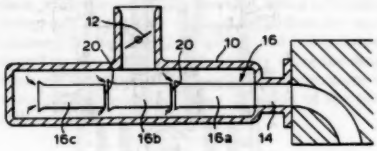
Thomas T. Ma, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 24, 1983, Ser. No. 544,943

Claims priority, application United Kingdom, Dec. 24, 1982, 8236758

Int. Cl.⁴ F02B *29/00*

U.S. Cl. 123—52 MB **2 Claims**



1. An induction manifold for a fuel injected multiple cylinder internal combustion engine which comprises a rigid air plenum chamber receiving a supply of air therein, a separate individual air intake pipe extending from the plenum chamber directly to each of individual engine cylinders, and an extension connected directly to each individual intake pipe and disposed within the plenum chamber for uniform uninterrupted supply of air to each individual intake pipe via its extension, each extension comprising a plurality of axially aligned and uniformly spaced pipe sections completely contained within said plenum chamber together providing an effective tuned length of intake pipe.

4,543,919

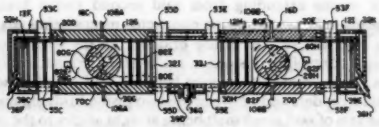
ENGINE

Douglas T. Carson, 7220 Francis, Lincoln, Nebr. 68505

Continuation-in-part of Ser. No. 334,963, Dec. 28, 1981, Pat. No. 4,485,769. This application Jun. 19, 1984, Ser. No. 622,195

Int. Cl.⁴ F02M *75/32*

U.S. Cl. 123—56 BC **6 Claims**



1. Apparatus comprising:

a piston assembly;

said piston assembly including at least one piston and at least one piston rod;

said at least one piston rod being adapted to be reciprocated within an engine in a direction of reciprocation;

a crank having an axis of crank rotation;

a crankpin having a center;

the center of the crankpin having a radius of crank rotation about the axis of crank rotation;

said at least one piston rod having a piston rod stroke length and a midstroke position halfway between the ends of the stroke length;

means for attaching at least the one piston to said at least one piston rod, whereby said rod is driven by said piston;

connector means adapted to be attached to the crankpin;

said connector means being rotatably mounted to said at least one piston rod;

said connector means having a center of connector rotation;

a resulting distance from the center of rotation of said connector means to the crankpin being equal to said radius of crank rotation;

said piston rod stroke length being equal to substantially four times the radius of crank rotation, whereby the connector means rotates with an angular velocity same as but in a direction opposite that of the crank;

interface means between said crank and said at least one piston rod for imparting motion only through a predetermined distance portion of midstroke from the crank to the piston assembly wherein the piston assembly achieves its maximum velocity at midstroke and is substantially twice orbital velocity of the center of the crankpin about the axis of crank rotation; and

said interface means being positioned to engage at least a length of surfaces substantially at the piston midstroke to force continuity of piston rod movement with a component of velocity of the piston rod being twice that of of the crankpin center in the direction of reciprocation of the piston rod through said predetermined portion of midstroke.

4,543,920

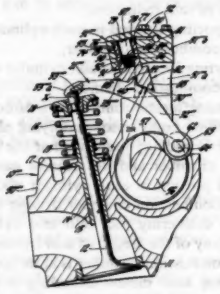
HYPOCYCLIC ROLLING CONTACT ROCKER ARM AND HYDRAULIC LASH ADJUSTER PIVOT

Duane J. Bonvallet, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 531,269, Sep. 12, 1983, Pat. No. 4,491,099, which is a continuation-in-part of Ser. No. 496,930, May 23, 1983, Pat. No. 4,476,822. This application Oct. 9, 1984, Ser. No. 658,792

Int. Cl.⁴ F01L *1/18*

U.S. Cl. 123—90.43 **9 Claims**



1. A reciprocating internal combustion engine of the type having an engine block means defining a cylinder with a port, a valve located for axial movement in said port and biased to a predetermined position, a valve actuator spaced from the valve and operable to effect reciprocation of the valve, and a valve train means including a rocker arm in operative engagement with the stem of the valve and the valve actuator and actuated in rocking movement to reciprocate said valve against said bias to open and close the port for engine operation, the improvement comprising: a lash adjuster support means fixed to said

engine block means and having at least one lash adjuster receiving socket therein, defined by a stepped blind bore providing an adjuster guide wall; a hydraulic lash adjuster operatively positioned in said socket, said hydraulic lash adjuster including a follower body slidable in said adjuster guide wall between a bottomed out position and a full extended position, said follower body having a closed end portion projecting outward from said support means which defines a fulcrum means to provide a rocking support intermediate the length of the rocker arm, said fulcrum means and said rocker arm defining a pair of cooperating concave and convex cylindrical bearing surfaces respectively, carrying the reaction forces of rocker arm pivotal movement, the radius of the concave bearing surface being substantially two times the radius of the convex bearing surface, with the geometric center of the concave bearing surface being located within the cross-sectional area of the stem of said valve during movement of said follower body between said bottomed out position and said fully extended position, the convex bearing surface of said rocker arm being located such that an extension thereof will intersect the contact point of said rocker arm on the stem of said valve at the free end thereof; restrainer means to anchor the cooperating cylindrical conformations for substantially rolling action in relation to each other, said restrainer means comprising a retainer pin means on one of said bearing surfaces and a slot means in the other of said bearing surfaces of a size to receive said retainer pin means, whereby within the range of rocker arm oscillation said pin means establishes substantially rolling contact between the said bearing surfaces.

4,543,921

MIXTURE-WARMING DEVICE FOR A TWO-STROKE INTERNAL COMBUSTION ENGINE USING A LOWER QUALITY FUEL

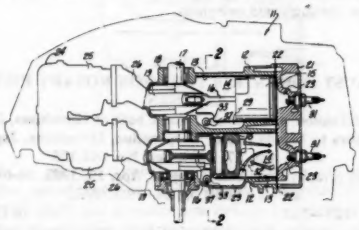
Katsumi Torigai, Shizuoka, and Akio Oka, Hammatsu, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Sep. 22, 1983, Ser. No. 534,565

Claims priority, application Japan, Sep. 29, 1982, 57-168609; Dec. 28, 1982, 57-227466; Feb. 23, 1983, 58-27752

Int. Cl.⁴ F02B *33/04*

U.S. Cl. 123—73 A **9 Claims**



1. In a crankcase compression two-cycle engine having a piston and cylinder defining a combustion chamber, a crankcase in which a fuel/air charge is compressed upon relative reciprocation of said piston and said cylinder, means for forming a fuel/air charge in said crankcase, a spark plug in said combustion chamber for firing a fuel/air charge therein and scavenge passage means for transferring a compressed fuel/air charge from said crankcase to said combustion chamber, the improvement comprising heating means interposed directly in the path of flow taken by the fuel/air charge from said crankcase between the means for forming the fuel/air charge and spark plug for heating the fuel/air charge prior to combustion in said combustion chamber.

4,543,922

STARTER FOR INTERNAL COMBUSTION ENGINES

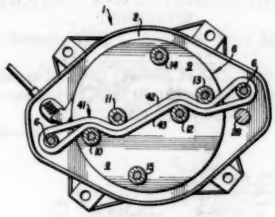
Ermanno Fugazza, Rivoli, and Giuseppe Dal Poz, Pianezza, both of Italy, assignors to A.M.S.E.A.-Azienda Meccanica, Caselette, Italy

Filed May 31, 1983, Ser. No. 499,523

Claims priority, application Italy, Jun. 7, 1982, 21728 A/82

Int. Cl.⁴ F02N *5/00*

U.S. Cl. 123—179 S **7 Claims**



1. A starter for an internal combustion engine, comprising:

a stator body for mounting on a stationary portion of an internal combustion engine provided with a shaft, said stator body defining an enclosure for a rotor;

a rotor within said stator body for mounting on the shaft of said engine and means for connecting and disconnecting said rotor to said shaft;

means for manually rotating said rotor in relation to said stator;

at lease two securing means on said stator in the form of a pair of pins positioned on diametrically opposite sides of said rotor;

first and second pairs of pins on the rotor positioned so that one pair is near one securing means and the other pair is near the other securing means, one pair of pins being in one quadrant of the rotor and the other pair of pins being in a diametrically opposite quadrant thereof;

each one of said first and second pairs of pins having one radially outer pin and a radially inner pin; an additional pin in each said opposite quadrant and near the periphery of said rotor;

a flattened strip of elastomeric material in the form of a closed loop;

said closed loop being fitted around said two securing means and defining two branches doubled together, which are passed across the rotor between each pair of pins of said opposite quadrant;

said two branches doubled together forming an undulated shape which maintains stresses in the elastomeric material even in the rest position;

whereby when the rotor is rotated to wind the elastomeric strip about the pins, the two radially outer pins of said pairs of pins and said two additional pins form a rectangular path for the stretched strip and the two radially inner pins of said pairs of pins form a "Z" shaped path for said stretched material.

4,543,923

ENGINE STARTER

Isao Hamano; Kiyoshi Yabunaka; Yoshifumi Akae; Toshinori Tanaka; Takeo Gotou, all of Himeji, and Kouichi Matsumoto, Tatsuno, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,840

Claims priority, application Japan, Dec. 3, 1982, 57-183899[U]

Int. Cl.⁴ F02N *7/00, 11/00, 15/02*

U.S. Cl. 123—179 F **4 Claims**

1. An engine starter comprising:

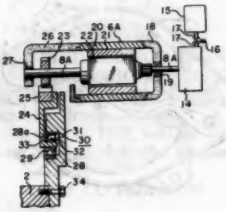
a d.c. motor,

a pinion secured to one end of a rotary shaft of the d.c. motor,

a rotary flange having a ring gear which is always interlocked with the pinion to be driven,

a flywheel which is, on one hand, connected to said rotary flange through a rotational force one-way coupling clutch and is, on the other hand, firmly secured to a crank shaft of an engine,

an air motor connected to the other end of the rotary shaft of said d.c. motor,



an air tank communicated to said air motor through a piping, and

an electromagnetic valve interposed in said piping, wherein said rotary flange is provided with said ring gear at an outer circumference thereof and a ball bearing at an inner circumference thereof, wherein said rotary flange is supported by said flywheel through said ball bearing, and wherein said pinion is directly interlocked with said ring gear.

4,543,924

REDUCTION OF CRANKSHAFT NOISE FROM AN INTERNAL COMBUSTION ENGINE

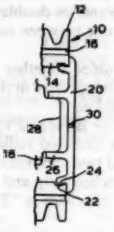
Philip G. Bostock, Benfleet, and Graham J. Holland, Canvey Island, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 23, 1984, Ser. No. 592,974

Claims priority, application United Kingdom, Apr. 13, 1983, 8309942

Int. Cl.[4] F16H *55/30*

U.S. Cl. 123—195 A **4 Claims**



1. A crankshaft pulley noise reducing means for an internal combustion engine having a pulley fixed for rotation with an engine crankshaft, the pulley having an outer rim and an annular hub joined by an elastic damper, the noise reducing means comprising a flexible elastic annular cover member of noise attenuating material engagable at its outer periphery with a side face of the hub and having means radially inwardly thereof engagable with and surrounding the end of the crankshaft to cover the noise attenuating area of the crankshaft pulley, wherein the cover member having retention means at its outer periphery to simultaneously engage both the side face of the pulley hub and an inner surface of the hub, the retention means being in the shape of a resilient hook, the hub inner surface having a recess therein for engagement by the hook to retain the cover member in place.

4,543,925

LIGHT-ALLOY CYLINDER HEAD FOR RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES

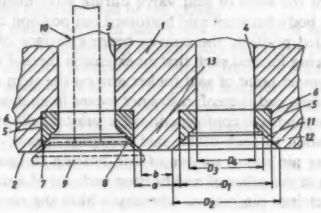
Max Ruf, Obereisesheim, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,477

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331145

Int. Cl.[4] F01L *3/22*

U.S. Cl. 123—188 S **1 Claim**



1. A light alloy cylinder head for reciprocating piston internal combustion engines comprising:

a bottom surface with gas-exchange openings controlled by poppet valves with valve heads, said openings having edges defining first valve seating surfaces (12) with a first outer diameter (D2); and

reinforcing rings disposed in said openings and having second valve seating surfaces (11) with a second outer diameter (D1) smaller than said first outer diameter;

said first and second valve seating surfaces correspondingly being beveled at a common angle cooperating to form total valve seating surfaces for each of said valve heads, wherein said second valve seating surfaces have a first internal diameter (D3) and said rings have intermediate circumferential walls reduced from said first internal diameter (D3) to a second internal diameter (D4), said intermediate walls being shaped for advantageous gas flow through said openings.

4,543,926

EXHAUST PORT STRUCTURE FOR ROTARY PISTON ENGINES

Hiroichi Takubo, and Hiroshi Sasaki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 17, 1984, Ser. No. 601,175

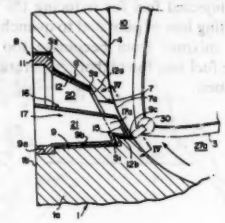
Claims priority, application Japan, Apr. 19, 1983, 58-69376

Int. Cl.[4] F02B *53/04*; F01C *1/22*

U.S. Cl. 123—242 **10 Claims**

1. A rotary piston engine including a casing comprised of a rotor housing having an inner wall of a trochoidal configuration and a pair of side housings gas-tightly secured to the opposite sides of the rotor housing to form a rotor cavity therein, a substantially polygonal rotor disposed in said casing with apex portions in sliding contact with the inner wall of the rotor housing to define working chambers of which the volumes cyclically change to conduct intake, compression, expansion and exhust strokes as the rotor rotates, intake port means provided in said casing to open to the working chamber in the intake stroke, exhaust port means provided in the rotor housing and including a single exhaust port which is opened to the working chamber in the exhaust stroke through a port opening formed in the inner wall of the rotor housing, said port opening having a width in the axial direction of the rotor housing and

a length in the peripheral direction of the rotor housing, said exhaust port having a depth extending from said port opening in an outward direction relative to the rotor housing inner wall, insert means comprising a hollow body located in said exhaust port, said hollow body having wall means located close to the inner wall of the rotor housing for covering a part



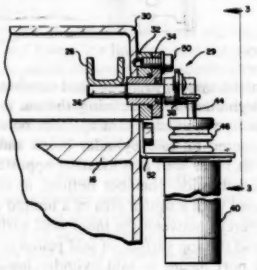
of the width of the port opening at a trailing part of the port opening leaving at least one early opening region of a relatively narrow width in the trailing part, partition means extending in the peripheral direction of the rotor housing from the wall means and in the depthwise direction of the exhaust port for at least partially separating the early opening region from the remaining region.

4,543,927

ENGINE CONTROL CIRCUIT

Dennis A. Luhn, Richfield, and Daniel A. Norrick, Anoka, both of Minn., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Dec. 8, 1983, Ser. No. 559,527
Int. Cl.[4] F01L *13/08*
U.S. Cl. 123—182 **18 Claims**



1. In an internal combustion engine having a combustion chamber, an exhaust valve, a drive shaft, a cam shaft driven by said drive shaft, and a rocker arm linkage for transmitting the rotation of said cam shaft to operate said exhaust valve, an unloading circuit, comprising:

(a) an electrical solenoid;

(b) camming means for operating said rocker arm linkage to hold said exhaust valve open in response to the energization of said electrical solenoid;

(c) an electrical time delay circuit for energizing said solenoid for a pre-selected time interval, said electrical time delay circuit including a first time delay relay for energizing said solenoid during the start-up and shut-down of said engine, and a second time delay relay for delaying the energization of said first time delay relay during the shut-down of said engine; and

(d) switching means for energizing said electrical time delay circuit during the shut-down of said engine, said switching means including means for energizing said electrical circuit during the start-up and shut-down of said engine,

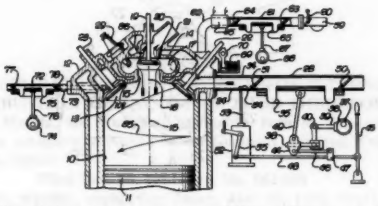
whereby said engine on slowing down is allowed to run-down for a first pre-selected time interval while loaded and for a second pre-selected time interval while unloaded.

4,543,928

TWO CYCLE ENGINE WITH DYNAMIC STRATIFICATION AND METHOD OF OPERATION THEREFOR

Ernest von Seggern, 1051 E. Angeleno Ave., Burbank, Calif. 91501

Continuation of Ser. No. 159,146, Jun. 13, 1980, abandoned. This application Aug. 10, 1983, Ser. No. 522,543
Int. Cl.[4] F02B *19/08, 31/00*
U.S. Cl. 123—262 **10 Claims**



1. In an internal combustion engine of the spark ignition type comprising:

a piston;

a cylinder having an axis along which said piston is reciprocable;

a combustion chamber at one end of said cylinder opposite said piston;

intake means communicating with said combustion chamber for periodically admitting working fluid thereto;

first intake manifold means for supplying said working fluid to said intake means and for causing said working fluid upon entering said combustion chamber to flow therethrough into said cylinder and to rotate circularly within said cylinder about the axis thereof, whereby said working fluid is stratified relative to residual exhaust gas in said cylinder;

means for supplying excess air to said first intake manifold means in a downward spiral pattern along the cylinder wall after said first intake means has commenced admitting working fluid to the combustion chamber such that the piston in its upward cycle drives said air upwardly along said cylinder wall;

an ignition chamber substantially in the form of a toroid having a circular axis and a normal axis and separate from said combustion chamber;

means for periodically generating a spark in said ignition chamber;

a connecting passage joining said ignition chamber to said combustion chamber with said ignition chamber normal toroidal axis and said connecting passage being substantially coincident with said cylinder axis;

exhaust means opening into said ignition chamber substantially on the normal toroidal axis thereof for permitting and controlling the expulsion of fluids from said ignition chamber and said cylinder;

second intake manifold means for supplying working fluid for said ignition chamber; and

means receiving the working fluid from said second intake manifold means for cyclically directing the working fluid into the ignition chamber in a converging stream which rotates circularly therein along the toroidal circular axis thereof in the same hand of rotation as the working fluid

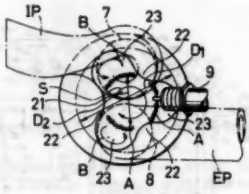
in the combustion chamber, the excess air along the cylinder wall entering the ignition chamber and rotating about the toroidal circular axis to provide excess air to complete the combustion of the working fluid.

4,543,929

TURBULENCE GENERATING METHOD AND INTERNAL COMBUSTION ENGINE FOR CARRYING OUT THE SAME

Masao Katsuoka; Yujiro Oshima; Takashi Noda, and Shigeo Suzuki, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 21, 1983, Ser. No. 534,449
Claims priority, application Japan, Sep. 21, 1982, 57-165791
Int. Cl.[4] F02B *19/08, 23/02*
U.S. Cl. 123—263 **18 Claims**



1. A turbulence generating method for a reciprocating internal combustion engine in which there are provided a combustion chamber defined by a piston, a cylinder head and a cylinder block, main and auxiliary recesses provided in said combustion chamber, said main and auxiliary recesses being connected through at least two projected portions;

an intake swirling mechanism for supplying intake air into said combustion chamber, including a swirling mechanism for swirling intake air, comprising the steps of generating a swirl of intake air in said main recess by means of said swirling mechanism and accelerating said swirl in said main recess as said piston rises;

forming a turbulent layer while occasionally converting said swirl into turbulences by means of said projected portions;

generating secondary swirls in said auxiliary recesses different from said swirl and counter-rotating to said swirl; and

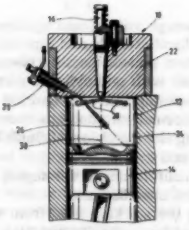
further generating a layer of turbulences between said swirl and said secondary swirls for separating said swirl from said secondary swirls, to thereby improve the combustion efficiency of said engine.

4,543,930

STAGED DIRECT INJECTION DIESEL ENGINE

Quentin A. Baker, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Nov. 17, 1983, Ser. No. 552,890
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—299 **4 Claims**



1. In a diesel engine using fuels having a lower cetane number than No. 2 diesel fuel in which the engine includes a main fuel injector and a pilot fuel injector which injects pilot fuel into the engine between 20° to 180° before top dead center, the improvement in the pilot fuel injector comprising,

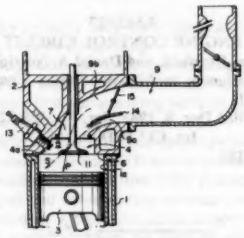
said pilot fuel injector directed towards the center line of the diesel cylinder and at an angle to be directed toward top of the piston, but avoiding the walls of the cylinder to stratify the injected fuel for reducing the fuel-air mixing rate, preventing loss of pilot fuel to quench zones, keeping the fuel-air mixture from becoming too fuel lean and injecting the fuel into the higher temperature in the center of the chamber.

4,543,931

ENGINE INTAKE SYSTEM

Mitsuo Hitomi, and Hiroyuki Oda, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Dec. 28, 1983, Ser. No. 566,440
Claims priority, application Japan, Dec. 29, 1982, 57-233394
Int. Cl.[4] F02B *31/00, 25/06*
U.S. Cl. 123—308 **15 Claims**

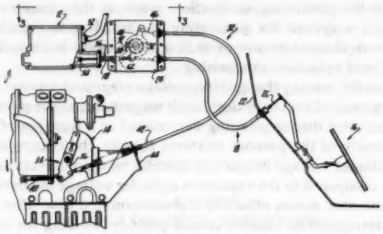


1. An intake system in an internal combustion engine comprising a cylinder block defining therein a cylinder bore; a piston slidably received in said cylinder bore; a cylinder head fixedly mounted on said cylinder block and having a recess formed in its inner wall at a location opposing the top of said piston; a combustion chamber defined in said recess in said cylinder head with a squish area of a limited clearance formed adjacent thereto between the inner wall surface of said cylinder head and the top surface of said piston at its top dead-center; intake port means in said cylinder head opening into at least one of said combustion chamber and said squish area; intake passage means in said cylinder head connected with said intake port means for feeding a charge of air-fuel mixture to said combustion chamber through said intake port means; exhaust port means in said cylinder head opening into at least one of said combustion chamber and said squish area; exhaust passage means in said cylinder head connected with said exhaust port means for discharging burned gas from said combustion chamber to the outside; said intake passage means comprising a light-load intake passage for introducing the mixture into said combustion chamber or said squish area in the circumferential direction of said cylinder bore so as to produce a swirl under light-load operation of the engine, and a heavy-load intake passage having an opening and closing valve adapted to be closed during light-load operation of the engine and opened during heavy-load operation of the engine for introducing the mixture into said combustion chamber or said squish area in the direction parallel to the central axis of said cylinder bore so as to suppress the generation of a swirl.

4,543,932
CABLE TRANSFER DEVICE WITH LOST MOTION COUPLING FOR GOVERNORS

Harry D. Sturdy, Wilmington, N.C., assignor to Sturdy Truck Equipment, Inc., Wilmington, N.C.

Filed Sep. 12, 1984, Ser. No. 649,785
Int. Cl.[4] F02D *31/00*
U.S. Cl. 123—342 **3 Claims**



1. For use in installing an engine governor on an engine having a driver operated accelerator adapted for coupling by a flexible cable to a throttle control member of said engine, said governor having an overriding throttle closing member which, when activated, is held at a throttle limiting position, a transfer device for coupling said accelerator and said throttle control member with said overriding throttle closing member, said transfer device comprising:

a support member including a fixed shaft,

a drive transmitting sleeve rotatably mounted on said shaft,

an accelerator lever rotatably mounted on said sleeve for rotation about said shaft,

an override lever mounted on said sleeve for rotation therewith about said shaft,

torsion spring means connected between said sleeve and said accelerator lever and exerting a biasing torque tending to cause rotation of said override lever and accelerator lever in opposite directions.

stop means mounted on one of said levers and engageble by the other of said levers for limiting said rotation,

a first cable connected between said accelerator and said accelerator lever, a second cable connected between said override lever and said throttle control member and a third cable connected between said overriding throttle closing member and override lever,

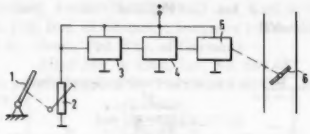
said torsion spring means being capable of transmitting sufficient torque without spring deflection so that said throttle control member moves concurrently with said accelerator until said override lever is held at a throttle limiting position by said overriding throttle closing member whereupon said spring means is deflected by further movement of said accelerator.

4,543,933
CIRCUIT ARRANGEMENT FOR THE ACTUATION OF THE THROTTLE VALVE OF A MOTOR VEHICLE INTERNAL COMBUSTION ENGINE

Jochem Kessler, Karlsruhe, and Bernd Heinrich, Rutesheim-Perouse, both of Fed. Rep. of Germany, assignors to Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,328
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209463
Int. Cl.[4] F02D *9/02*
U.S. Cl. 123—361 **2 Claims**

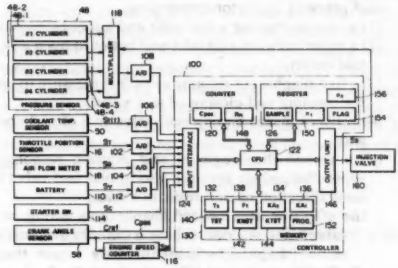
1. A circuit arrangement for the actuation of a throttle valve of a motor vehicle internal combustion engine having a drive pedal, whose rotary position is converted into a corresponding voltage of a potentiometer connected therewith, said voltage being transmitted by way of a control apparatus to an electrical adjusting member for the actuation of the throttle valve, characterized by further means for effectively eliminating jerking of the motor vehicle within a predetermined frequency range, wherein the further means is an active Wien-Robinson suppression filter whose resonant frequency is tuned to the oscillating frequencies to be suppressed of about 2 to 3 hertz connected between the potentiometer and the control apparatus.



4,543,934
AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE AND METHOD THEREFOR

Tatsuo Morita, and Kunifumi Sawamoto, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 16, 1983, Ser. No. 562,089
Claims priority, application Japan, Jan. 10, 1983, 58-1145; Dec. 21, 1983, 57-222847
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—435 **54 Claims**



1. An air/fuel ratio control system for an internal combustion engine having a plurality of engine cylinders comprising:

a first detector for detecting engine operating conditions to produce an engine operating condition indicative signal representative of a basic fuel delivery parameter;

a second detector for detecting cycle-to-cycle fluctuations of the output of each of the engine cylinders to produce a detector signal when the engine fluctuation rate is outside of a given allowable range;

a counter means for counting occurrences of the non-allowable engine fluctuations in each engine cylinder and outputting a first counter signal representative of the number of engine cylinders in which non-allowable engine fluctuations are detected; and

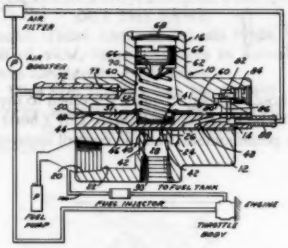
a controller unit responsive to said engine operating condition indicative signal for deriving a fuel delivery amount based thereon, and deriving an air/fuel ratio which varies in the direction of a leaner mixture at a first given rate as long as the first counter signal value remains less than a given threshold and in the direction of a richer mixture at a second given rate when the first counter signal value is equal to or greater than said given threshold.

4,543,935

PRESSURE REGULATOR WITH VARIABLE RESPONSE

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Aug. 21, 1984, Ser. No. 642,776
Int. Cl.[4] F02M 37/04
U.S. Cl. 123—463 5 Claims



1. In a fuel supply system for an internal combustion engine in which is provided:

(a) a source of fuel under pressure,

(b) a means for introducing fuel into the internal combustion engine,

(c) a pressure booster for air to be furnished to said means, and

(d) a pressure regulator having pressure responsive means subject to fuel pressure from said source and to air pressure from said pressure booster to provide an air-to-fuel pressure ratio of fuel and air furnished to said means to compensate for the increased density of air resulting from the air boost pressure,

said pressure regulator comprising:

(1) a housing having a fuel inlet and a fuel by-pass outlet,

(2) a valve between said inlet and outlet to open and close said outlet,

(3) a first diaphragm responsive to fuel pressure to control the opening and closing of said valve,

(4) resilient means biasing said valve to a closed position, and

(5) a second diaphragm in said housing responsive to super-charged air pressure also to bias said valve in the same direction as said resilient means,

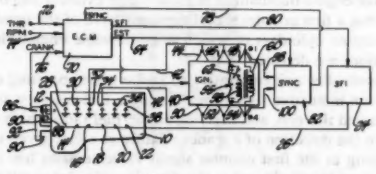
the effective area of said diaphragms acting on said valve being in a ratio wherein the effective area of the second diaphragm is significantly larger than the effective area of said first diaphragm.

4,543,936

SEQUENTIAL FUEL INJECTION SYNC PULSE GENERATOR

Robert F. Gardner, Flushing, and Bruce D. Rohn, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1984, Ser. No. 650,861
Int. Cl.[4] F02B 5/00, 3/00; F02M 39/00; F02P 5/04
U.S. Cl. 123—475 4 Claims



1. For an internal combustion engine including at least two cylinders in which gaseous mixtures alternately undergo compression and expansion before and after the ignition thereof, and an ignition system of the type including primary and secondary transformer windings, the secondary winding of which is connected at one end thereof to a sparking device in one of said cylinders and at the other end thereof to a sparking device in the other of said cylinders such that interruption of current in the primary winding generates ignition voltages of opposite polarity at the ends of said secondary winding for triggering substantially concurrent electrical discharges at said sparking devices for producing an ignition event in the compression cylinder, a system for generating electrical sync signals in relation to the occurrence of such ignition event in a specified one of said cylinders, comprising:

means for sensing the ignition voltage magnitudes generated for each of said cylinders, such magnitudes at the point of electrical discharge being determined as a function of the density of the gaseous mixtures therein, the compression cylinder voltage magnitude thereby being relatively large as compared to the expansion cylinder voltage magnitude;

comparator means effective a predetermined time after the interruption of current in said primary winding for comparing the sensed ignition voltage magnitudes of said two cylinders and for generating an output signal if the sensed voltage magnitude of the specified cylinder is larger than that of the other of said cylinders, whereby such output signals are repetitively generated in coincidence with the generation of a compression cylinder ignition voltage for said specified cylinder; and

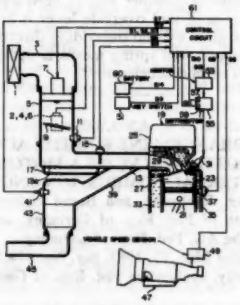
means for generating an electrical sync signal in timed relation to the generation of an output signal by said comparator means, whereby the sync signals are repetitively generated in timed relation to the occurrence of ignition events in said specified cylinder.

4,543,937

METHOD AND APPARATUS FOR CONTROLLING FUEL INJECTION RATE IN INTERNAL COMBUSTION ENGINE

Hidetoshi Amano, Okazaki; Shinichi Abe; Mitsuharu Taura, both of Toyota, and Toshiaki Mizuno, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 9, 1984, Ser. No. 588,101
Claims priority, application Japan, Mar. 15, 1983, 58-43457; Mar. 15, 1983, 58-43458; Apr. 19, 1983, 58-68753
Int. Cl.[4] F02M 51/00
U.S. Cl. 123—491 21 Claims



1. A method of controlling the fuel injection rate in an internal combustion engine, said internal combustion engine having a fuel injector provided at a throttle body, having a throttle valve, said fuel injector being adapted to inject a fuel into an intake passage so as to be mixed with intake air in said intake passage, thereby forming an air-fuel mixture for induction into

a combustion chamber of said engine along said intake passage, said method comprising the steps of:

computing, in accordance with the engine speed and the load on the engine, a basic injection time duration TP for injecting said fuel in synchronism with a crank rotation engine; and

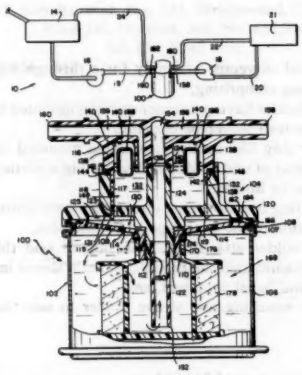
correcting said basic injection time duration TP during warming up of said engine by using, at least a warm-up correction coefficient FWL which is determined in accordance with an engine coolant temperature detected during the operation of said engine and a start temperature correction value ADD which is selected in accordance with an intake air temperature detected substantially at the time of start up of said engine and attenuated thereafter in accordance with the time elapsed after the start up of said engine.

4,543,938

IN-LINE FUEL RESERVOIR

Emil Szlaga, Sterling Hts., Mich., assignor to Stant Inc., Connersville, Ind.

Filed Feb. 2, 1984, Ser. No. 576,316
Int. Cl.⁴ F02M *55/00*
U.S. Cl. 123—514 **14 Claims**



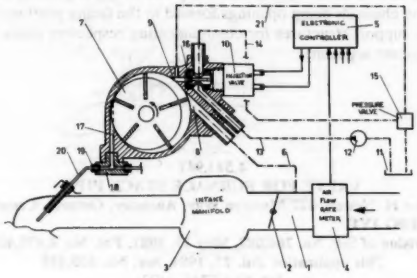
1. In a fuel supply system having a high-pressure pump for pumping fuel to an engine, a low-pressure pump for pumping fuel from a fuel tank to the high-pressure pump, a fuel reservoir comprising means providing a fuel supply chamber, means providing a fuel supply inlet to the fuel supply chamber, means for coupling the fuel supply inlet to the low-pressure pump, means providing a fuel supply outlet from a fuel supply chamber, means for coupling the fuel supply outlet to the high-pressure pump, means providing a fuel return inlet, means providing a fuel return outlet, means providing a first fuel opening between the fuel return inlet and the fuel supply chamber, means providing a second fuel opening between the fuel return inlet and the fuel return outlet, means for coupling the fuel return inlet to the engine, means for coupling the fuel return outlet to the fuel tank, and valve means for controlling the flow of fuel through the first and second fuel openings to direct returned fuel to the fuel supply chamber and the fuel tank, the valve means including a first valve means for closing the first fuel opening when a predetermined level of fuel is present in the fuel supply chamber to direct returned fuel through the second fuel opening and the fuel return outlet and for opening the first fuel opening when the fuel in the fuel supply chamber is below the predetermined level to allow returned fuel to enter the fuel supply chamber.

4,543,939

FUEL SUPPLY ASSEMBLY FOR MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINES AND ASSOCIATED METHODS OF OPERATION

Fritz Ehrhart; Asoke Chattopadhay, and Karl Schmidt, all of Neuss, Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. K.G., Neuss, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,457
Claims priority, application European Pat. Off., Jan. 20, 1983, 83100469.2
Int. Cl.⁴ F01B *25/08*
U.S. Cl. 123—533 **16 Claims**



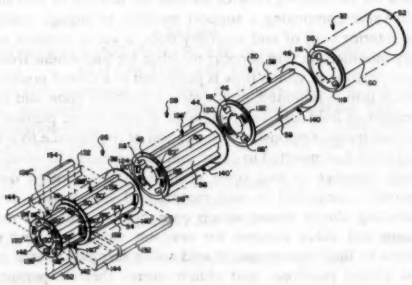
1. In a fuel supply assembly for an internal combustion engine having an air intake duct with a throttle valve therein, a branch air duct branching off from the intake duct upstream of the throttle valve, means including an injection valve for supplying fuel in an amount as a function of operating parameters, a pump for conveying the air in the branch duct with the fuel injected by the injection valve as an air-fuel mixture to respective inlet valves of the cylinders of the engine, the improvement wherein said injection valve includes a fuel supply port which opens directly into said pump, said pump having an outlet connected to said air intake duct to supply air-fuel mixture to the inlet valves of the engine via said air intake duct such that each inlet valve receives air from the intake duct and air-fuel mixture from said pump.

4,543,940

SEGMENTED RADIANT BURNER ASSEMBLY AND COMBUSTION PROCESS

Wayne V. Krill, Sunnyvale; Thomas Wong, Menlo Park, and James Gotterba, Santa Clara, all of Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Aug. 16, 1983, Ser. No. 523,799
Int. Cl.⁴ F24C *3/04*
U.S. Cl. 126—92 AC **15 Claims**



1. A radiant burner assembly for installation in a combustion

chamber comprising the combination of a plurality of burner segments, each segment including an active burner wall of porous fiber composition for supporting surface combustion of reactants and a support structure comprised of a material which is inactive for combustion, said wall joined with said support structure along an interface to at least partially enclose a plenum for the unburned reactants, sealing means extending along the interface and adhering therealong to the surfaces of the wall and support structure to seal the interface, securing means for joining together in abutting relationship the facing portions of the support structures of adjacent segments to form a unitary burner assembly, and means forming flow channels for serially directing an inlet stream of unburned reatants from one end of the assembly into the plena of the segments, said flow channels being openings formed in the facing portions of the support structures for communicating respective plena of adjacent segments.

4,543,941

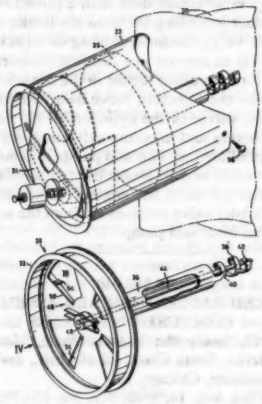
VALVE FOR FURNACE STACK PIPE

John H. Newell, 227 Manitou Way, Ancaster, Ontario, Canada (L9G 1Y1)

Division of Ser. No. 264,087, May 15, 1981, Pat. No. 4,470,401. This application Jul. 27, 1984, Ser. No. 635,195

Int. Cl.[4] F23J *3/00*

U.S. Cl. 126—293 **15 Claims**



1. A valve for installation in an auxillary air duct of a furnace stack for controlling flow of air into the interior of said stack, said valve comprising a support member to engage sealingly the interior wall of said auxillary duct, a valve member movably mounted on said support member for movement from an open position in which flow is permitted to a closed position in which flow is inhibited, motor means operable upon said valve member to hold said valve member in said closed postion and control means responsive to operation of the furnace to which said stack is connected to cause said motor means to move said valve member to said open position, a lost motion device operably connected to said motor, said lost motion device including clutch means which operably connect said motor means and valve member for conjoint movement, and stop means to limit movement of said valve member at said open and closed positions, said clutch means thereby permitting continued movement of said motor upon engagement of said valve member with said stop means.

4,543,942

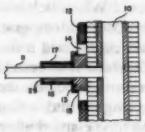
INSULATED FLUE ASSEMBLY

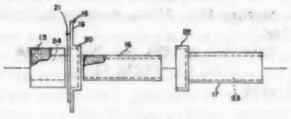
Gerald Bauer, Wilton, Wis., and Henry B. Swan, Burlington, Vt., assignors to B&B Specialties Inc., Wilton, Wis.

Filed Dec. 24, 1984, Ser. No. 686,079

Int. Cl.[4] F23J *13/00*

U.S. Cl. 126—314 **8 Claims**





1. An insulated stovepipe assembly for a through-the-wall stovepipe opening comprising,

(a) a thimble holder having a center opening mounted in said through-the-wall stovepipe opening,

(b) a circular ring like insulating thimble mounted in said center opening of said holder and encircling a portion of a stovepipe to be insulated,

(c) a circular ring like stovepipe insulating sleeve journalled upon a protion of the stovepipe to be insulated,

(d) a sleeve holder attached to one side of said thimble holder for positioning said thimble and said sleeve in axial alignment and facial abutment, and

(e) means for attaching said sleeve holder to said thimble holder.

4,543,943

HEATER FIRED WITH LIQUID FUEL

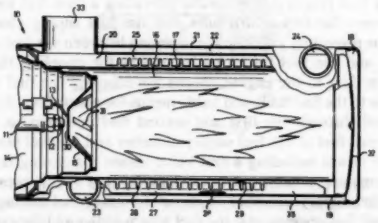
Reinhold Gruber, Gauting, and Dieter Räthel, Mittelstetten, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,210

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208828

Int. Cl.[4] F24H *1/00*

U.S. Cl. 126—350 R **33 Claims**



1. A liquid fuel fired heater, especially a vehicle heater, utilizing a liquid heat transfer medium, comprising a tube

defining a combustion chamber and a pot-shaped heat exchanger mounted over the combustion chamber tube, so as to leave an annular space therebetween for conducting hot exhaust gas, said exchanger being constructed for deflecting the exhaust gas, in an axial direction, from said combustion chamber to said annular space, and having ribs on an internal lining thereof which project into the annular space, said ribs being arranged essentially radially and parallel to a central longitudinal axis of the combustion chamber and the heat exchanger, wherein at least some of the ribs are equipped, over at least a portion of their lengths, with means for vorticization of the exhaust gas;

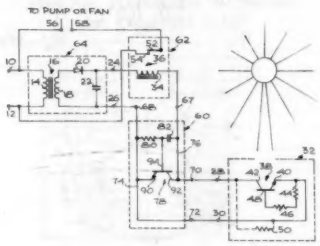
wherein the ribs equipped with the vorticization means are each comprised of at least one row of blades having a longitudinally extending free edge, essentially transversely running slots being provided in each blade, said slots being open in a direction away from said heat exchanger inner lining at said free edge, blade segments being formed therebetween, and said ribs are free of said vorticization means in an end portion at the vicinity of the area wherein said deflecting of the exhaust gas occurs, said end portion constituting on the order of approximately 25% of the length of the ribs, for preventing damage to said vorticization means by burning.

4,543,944

FURTHER-IMPROVED CONTROL SYSTEM FOR SOLAR HEATING SYSTEMS

Robert T. Schultz, P.O. Box 633, Wrightwood, Calif. 92397

Filed Jul. 18, 1984, Ser. No. 632,044
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—419 **3 Claims**



1. For use in a solar-heating system having transferring means for transferring elsewhere solar-generated heat energy from solar-energy collecting means, control means for controlling said transferring means, said control means, including;

terminal means adapted to receive operating power for said transferring means;

a source of D.C. operating power for said control means;

a relay having a solenoid and at least one pair of normally-open contacts;

a sensor module including a phototransistor having a collector, an emitter and a base;

said sensor module also including a temperature-sensitive resistor coupled between said emitter and said base of said phototransistor;

time-delay means having first and second input terminals and first and second output terminals;

said collector being coupled, through said first input and output terminals of said delay means and said solenoid to said source of D.C. operating power;

said phototransistor being responsive to solar energy incident thereon to become conductive at a solar energy level dependent upon the magnitude of said temperature-sensitive resistor;

said relay being responsive, following a delay by said delay means, to conduction by said phototransistor to close said normally open contacts with a corresponding delay;

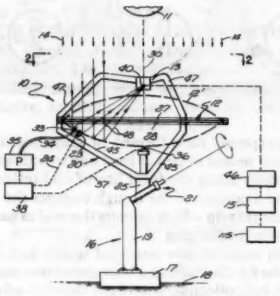
said normally open contacts being adapted for serial connection between at least one of said terminal means and said transferring means.

4,543,945

STRUCTURE AND MANUFACTURE OF RADIATION COLLECTORS

Mark Hattan, Orange, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Filed Feb. 6, 1984, Ser. No. 577,606
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—438 **25 Claims**



1. A collector for receiving radiation from a source, comprising:

means forming a chamber within which a pressure different than that at the outside of the chamber may be maintained and having an essentially circular wall of flexible sheet material which is curved by said differential pressure generally circularly about an axis and concavely with respect to said source and reflects radiation from said source generally toward said axis;

said means including an essentially rigid structure extending essentially circularly about said axis and essentially along the periphery of said circular flexible wall and which restrains said periphery of the wall against constriction inwardly toward said axis by said differential pressure as far as the periphery would constrict in the absence of said structure, and which thereby constrains said wall to assume a shape more closely approaching that of a paraboloid than if said structure were not present;

said structure including elements received at opposite sides of said periphery of said wall and between which said periphery is clamped to rigidly fix the diameter of said periphery of the wall while not restraining flexure of other portions of the wall; and

means for receiving radiation concentrated essentially at said axis by said reflective wall.

4,543,946

NONTRACKING PARABOLIC SOLAR ENERGY COLLECTOR APPARATUS

Michael Gill, Sugarland, and Mark C. Rogers, Baytown, both of Tex., assignors to Advanced Solar Systems, Midland, Tex.

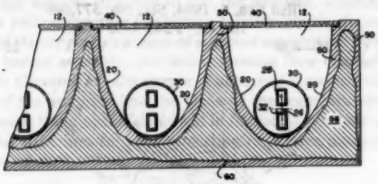
Continuation-in-part of Ser. No. 476,176, Mar. 17, 1983, Pat. No. 4,475,537, which is a continuation of Ser. No. 324,516, Nov. 24, 1981, abandoned, which is a continuation of Ser. No. 48,448, Jun. 14, 1979, abandoned. This application Aug. 13, 1984, Ser. No. 640,068
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—438 **8 Claims**

1. A solar energy collection apparatus comprising:

a support;

at least one trough in the support, said at least one trough having an internal reflective surface comprising two op-

positely disposed truncated parabolic sections rotated away from its vertical axis to create a wide angle of acceptance opening, and a reflective circular face joining the ends of said two parabolic sections which are opposite said acceptance opening, said reflective surface being molded with said support, said internal reflective surface having a focal line to which said internal reflective surface reflects incident solar energy;



a heat entrapment tube formed of glass which is vacuum sealed and nested in said at least one trough and extending substantially along the focal line of said reflective surface such that a portion of the trough engages the heat entrapment tube therein which permits thermal expansion of said collector cylinder; and

a U-shaped metallic tube mounted within said heat entrapment tube for conducting a heat absorption material therethrough for collecting heat from incident solar energy.

4,543,947

CERVICAL SPINE COLLAR

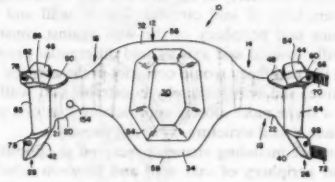
Ralf W. Blackstone, 4678 Barker Way, Long Beach, Calif. 90814

Continuation-in-part of Ser. No. 201,425, Oct. 28, 1980, Pat. No. 4,401,111. This application Aug. 19, 1983, Ser. No. 524,849

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.⁴ A61H *1/02*

U.S. Cl. 128—75 **22 Claims**



1. A cervical spine collar for providing cervical spine stabilization when placed about a patient's neck comprising:

an elongated superstructure comprised of a rear section, left and right pliable sections, left and right side sections and left and right front sections, and adapted to be placed about said patient's neck and fastened closely about said patient's lower head and upper torso to prevent substantial extension, flexion or lateral flexion;

said left and right front sections collectively being capable of preventing substantial flexion when said collar is fastened about said neck and each having a mandible buttress, a center support and a manubriosternal buttress which collectively define a cricothyrotomy passage sufficiently large to permit useful access to said patient's anterior throat even palpatation of carotid pulses;

said rear section designed to fit behind said patient's head and neck to prevent substantial extension and comprised of an extension block, an upper comfort edge and a lower comfort edge, said extension block being sufficiently vertically rigid to prevent extension, said upper comfort edge being sufficiently flexible to secure and accomodate nonlinear portions of the back of said head and said lower comfort edge being sufficiently flexible to secure and accomodate the nonlinear portions of said patient's upper back;

said left and right pliable sections connect to either end of said rear section respecitvely and are sufficiently flexible to permit said collar to bend preferentially at said pliable sections when bent about said neck and entrap the occipital tubercles of the skull to prevent lateral flexion and are curved upon their inferior surface to accomodate said patient's shoulders;

said left and right side sections connect said left and right pliable sections to said left and right front sections respectively;

left and right support fins attached to left and right pliable sections respectively, each support fin extending horizontally out from said collar over a collar bone of said patient and curved to accomodate said shoulder surfaces.

4,543,948

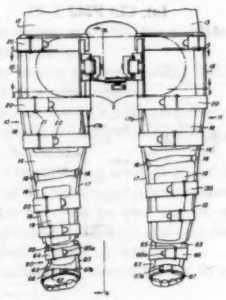
APPARATUS AND METHOD FOR APPLYING ROTATIONAL PRESSURE TO PARTS OF THE BODY

Robert L. Phillips; R. Daryl Phillips, and Donald C. Mason, all of 2526 12th Ave. South, Great Falls, Mont. 59405

Continuation-in-part of Ser. No. 508,897, Jun. 27, 1983, abandoned. This application Jul. 22, 1983, Ser. No. 516,321

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 A **13 Claims**



1. Apparatus for applying rotational pressure to the hip joints of a human patient, comprising two separate cast means, each being adapted to be placed about a leg of a patient so as to hold such leg against substantial rotation relative to such cast means; and means adjustably and directly, without contacting or being secured to other body parts, interconnecting the separate cast means adapted to hold the cast means at an adjustable angle of rotation along their longitudinal axises one to another to cause rotation of each leg to thereby put rotational pressure on each hip joint.

4,543,949

CUSTOM VALVED CERVICAL CAP

Robert A. Goepp, Chicago, and Uwe E. Freese, Oak Park, both of Ill., assignors to University Patents, Inc., Westport, Conn.

Division of Ser. No. 310,493, Oct. 13, 1981, Pat. No. 4,467,789, which is a division of Ser. No. 108,319, Dec. 31, 1979, Pat. No. 4,322,463. This application Jun. 11, 1984, Ser. No. 619,037

Int. Cl.⁴ A61F *5/46*

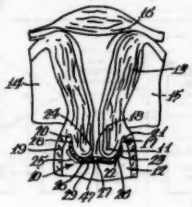
U.S. Cl. 128—127 **21 Claims**

1. A non-invasive birth control device which comprises

a cup-shaped elastomeric shell having a convex outer surface and a concave inner surface that is substantially complementary with a contiguous surface of portio vaginalis cervicis in its actual configuration when in contact therewith, said shell defining an aperature at the apex thereof

and having a depth sufficient to receive a major portion of said portio, but the periphery of said shell terminating short of fornices vaginae; and

an elastomeric web over said aperture and secured to said outer surface about said aperture defining a passageway communicating with said aperture and providing a discharge port along said convex outer surface and offset from said aperture;



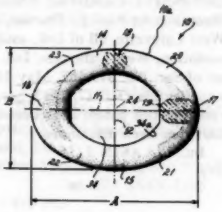
said web conforming to and coacting with a contiguous portion of said convex outer surface to provide a one-way valve means for uterine discharge entering said aperture from within said shell.

4,543,950

PATIENT'S MOUTHPIECE

Richard H. Keys, Jr., 170 Magnolia Ave., Cincinnati, Ohio 45246

Filed Apr. 11, 1984, Ser. No. 599,003
Int. Cl.[4] A61M *29/00*
U.S. Cl. 128—136 **7 Claims**



1. A mouthpiece for a patient to aid in maintaining a seal between a face mask and cheeks of a patient upon exposing that patient to a gaseous anesthesia through use of said face mask, said mouthpiece comprising:

a substantially normally curved, flexible one-piece member being generally elliptically-shaped when flexed into a generally flat configuration and sized to be received in a patient's mouth between the patient's jaw, lips and cheeks and underlie the patient's lips and cheeks,

said member having a centrally elliptically-shaped oral port and having upper and lower jaw sections connected one with the other by side sections,

said member having a major axis which intersects said mouthpiece's side sections and a minor axis which intersects said mouthpiece's jaw sections when said unit is in said flattened state, said jaw and side sections having cross-sectional areas as measured along said minor and major axis, respectively, said jaw sections' cross-sectional areas being substantially circular from which that cross-sectional area diverges to a substantially larger, thicker elliptical cross-sectional area at said side sections,

said jaw sections' cross-sectional areas being adapted to be situated entirely between the gums and the lips and cheeks of the patient and said side sections being adapted to be situated between the patient's gums and cheeks, and

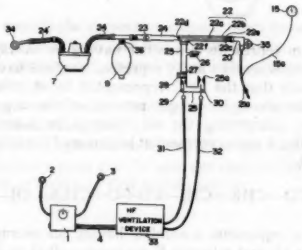
said member having sufficient thickness and having sufficient hardness such that, when inserted in the patient's mouth, the patient's lips are held in spaced-apart relationship to facilitate the flow of gas into and out of the patient's mouth and the patient's cheeks are urged outwardly to cooperate with the periphery of an anesthesia face mask in order to maintain a seal between the face mask and the patient's cheek areas as desired by the attenting physician during breathing of that patient through the face mask.

4,543,951

RESPIRATOR WITH TWO JET GAS INJECTION TUBES

Tran N. Phuc, Ohmiya, Japan, assignor to Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,522
Claims priority, application Japan, Nov. 30, 1982, 57-209948
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.25 **6 Claims**



1. A high-frequency respirator comprising;

a double tube with inner and outer tubes disposed in a substantially concentric arrangement with each other, said inner tube having first and second openings at opposite ends thereof with respect to its longitudinal direction and said outer tube having third and fourth openings, said third opening being formed at one end thereof with respect to its longitudinal direction and said fourth opening being formed in the wall of the outer tube at the vicinity of the other end thereof, wherein said first opening opens into said outer tube at the vicinity of said third opening and the periphery of said second opening is formed integral with the other end of said outer tube;

an endotracheal cannula coupled to said double tube through said third opening;

first communication tube means coupled to said double tube through said second opening for feeding a respiration gas to be supplied from a gas source to said endotracheal cannula through said inner tube;

second communication tube means coupled at one end thereof to said double tube through said fourth opening and opening into air at the other end thereof, said second communication tube means being mounted with first and second jet gas injection tubes positioned at the vicinity of said other end, said first injection tube being directed toward said one end of said second communication tube means and said second injection tube being directed toward said the other end of said second communication tube means; and

high-frequency ventilation means having first and second outlet ports for alternately and intermittently outputting therefrom a gas at a frequency of 200 to 5000 cycles per minute, said first and second outlet ports being connected to said first and second injection tubes, respectively, so that said gas outputted from the ventilation means is transformed into a jet stream which causes said respiration gas,

introduced into said endotracheal cannula through said inner tube, to oscillate.

4,543,952

FLEXIBLE COPOLYMERS OF P-(HYDROXYALKOXY)BENOZIC ACID AND PLIANT SURGICAL PRODUCTS, PARTICULARLY MONOFILAMENT SURGICAL SUTURES, THEREFROM

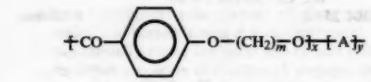
Shalaby W. Shalaby, Mountainville, and Donald F. Koelmel, Lebanon, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 253,418, Apr. 13, 1981, abandoned. This application Sep. 14, 1983, Ser. No. 532,239

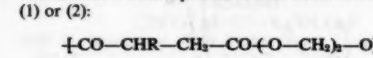
Int. Cl.[4] C08G *63/66;* **A61L** *17/00*

U.S. Cl. 128—335.5 **13 Claims**

1. A surgical filament comprising a random copolymer of the formula:

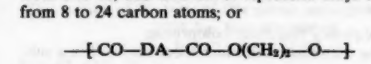


wherein m represents a number having an average value of from 2 to 6, wherein x and y represent numbers having average values such that the units represented by A comprise from about 1 to about 50 weight percent of the copolymer, the remainder comprising the alkyleneoxy benzoate units, and wherein the A units represent at least one of the following units (1) or (2):



(1)

wherein n represents a number having an average value of from 2 to 12, and wherein R represents alkyl or 2-alkenyl of from 8 to 24 carbon atoms; or



(2)

wherein DA represents the residue after removal of the carboxyl groups of a dimer acid of long chain unsaturated fatty acid, said residue having an approximate formula of $C_{34}H_{66}$, and wherein n represents a number having an average value of 2 to 12; wherein said filament is characterized by the following physical properties:

Knot strength greater than about 25×10^3 psi

Tensile strength greater than about 45×10^3 psi

Young's Modulus less than about 250×10^3 psi.

4,543,953

ANALOG TELEMETRY SYSTEM FOR BIOMEDICAL IMPLANT

Chester D. Slocum, and Vincent T. Cutolo, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Jul. 18, 1983, Ser. No. 514,514

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—419 PT **5 Claims**

1. An implant analog telemetry system comprising

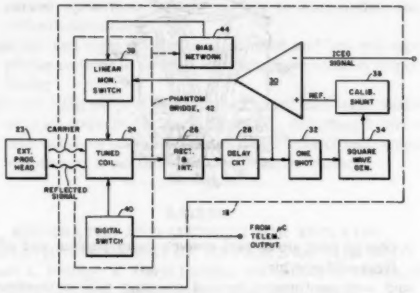
a fully implantable biomedical device including a tuned coil circuit with a tuned coil and transistor means in circuit therewith having a linear operating region for altering the impedance of said tuned circuit as a function of an applied control input, and

an external telemetry receiver including means for generating a constant frequency carrier at the tuned frequency of said coil, and receiver means for producing an output varying in response to the phase shift between the externally generated carrier and the received signal due to the reflected signal from said tuned coil circuit,

said implanted device further including a linear amplifier having an input connected to said transistor means as the control signal, and

means for supplying a variable bias voltage to said transistor means as a function of the level of energy coupled into said tuned coiled circuit from said external telemetry receiver,

said variable bias means including means for supplying a nominally fixed bias to said transistor means corresponding to the middle of said linear operating region and means for rectifying the signal coupled into the tuned coil circuit



due to said carrier frequency and combining the rectified signal with said fixed bias to provide a supplemental variable bias component which creates an inverse relationship with the coupling level,

whereby variations in the proximity or strength of the coupled carrier signal have a reduced effect on the amplitude of the recovered waveform at the output of said receiver means.

4,543,954

EXERCISE RESPONSIVE CARDIAC PACEMAKER

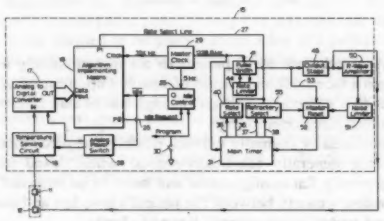
William A. Cook, Bloomington; Neal E. Fearnot, and Leslie A. Geddes, both of West Lafayette, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 379,667, May 19, 1982, Pat. No. 4,436,092. This application Oct. 17, 1983, Ser. No. 542,590

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. A cardiac pacemaker including means for variably controlling the stimulation rate of the heart according to the level of muscular exertion in the body, comprising:

a sensor means for sensing a body temperature;

a stimulus means for applying an electrical stimulus to a heart;

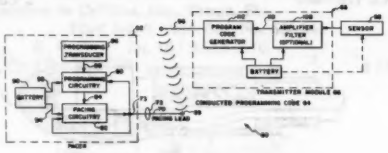
a control circuit means for calculating dT/dt of said sensed body temperature, said control circuit means including means for generating a rate control signal according to a predetermined algorithm relating heart rate to dT/dt; and

a cardiac pacemaker connected to said control circuit means and said stimulus means and responsive to said rate control signal to variably control the stimulation rate of the heart.

4,543,955
SYSTEM FOR CONTROLLING BODY IMPLANTABLE ACTION DEVICE

Edward A. Schroeppel, Miramar, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 1, 1983, Ser. No. 519,142
Int. Cl.[4] A61B *5/00*; A61N *1/00*; A61M *5/00*
U.S. Cl. 128—635 **26 Claims**



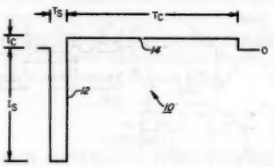
1. In a system comprising a body implantable device and a sensor assembly for programming or reprogramming said action device, which device is operable to act upon the body in response to changes in a sensed parameter and which has circuitry for deciphering coded signals used to program said device, the improvement comprising said sensor assembly being a separate, independent assembly which is independent of the action device, which is capable of being implanted within a body, and which includes:

sensor means for sensing a physiological parameter in a body, signal converting circuitry means for converting signals generated by said sensor means to coded electrical signals, such as conventional digital program codes of the type normally used in programming or reprogramming the action device, and transmitting means for transmitting said coded electrical signal related to the sensed parameter to the action device which is operable to decipher the coded electrical signal and act accordingly, upon the body.

4,543,956
BIPHASIC CARDIAC PACER

Harry Herscovici, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 24, 1984, Ser. No. 613,888
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **13 Claims**



1. A method of detecting evoked response from the heart, comprising the steps of:

providing a rectangular stimulating pulse;

determining the charge of the stimulation pulse;

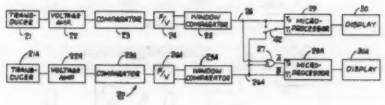
thereafter generating a rectangular compensating pulse having an opposite polarity to the stimulating pulse and having an absolute amplitude that is less than the absolute amplitude of the stimulating pulse and having a duration that is continued during the generation of the compensating pulse until the charge of the compensating pulse is equal to the charge of the stimulating pulse; and

thereafter detecting the evoked response using the same electrodes that are used for providing the stimulating and compensating pulses.

4,543,957
HUMAN RESPONSE APPARATUS AND METHOD

Ernest H. Friedman, 1831 Forest Hills Blvd., East Cleveland, Ohio 44112; Gary G. Sanders, Lakewood, Ohio, and Steven L. Hunter, Livermore, Calif., assignors to Ernest H. Friedman, East Cleveland, Ohio

Filed Jun. 13, 1983, Ser. No. 503,821
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—630 **49 Claims**



1. A computing device for evaluation of human response, comprising in combination:

input signal receiving means operable to receive first type signals from a signal generator of at least a first human subject;

means to mesure the respective elapsed times between consecutive signals from said first human subject;

means for sorting said elapsed times into at least two frequency levels;

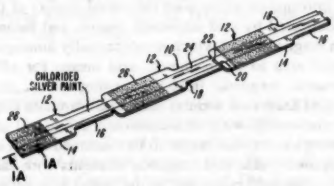
computing mens to determine the average elapsed time of each of said levels; and

recording means operable to record on a time base the average frequency level and the average elapsed time of each level for at least said first human subject.

4,543,958
MEDICAL ELECTRODE ASSEMBLY

James V. Cartmell, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 246,873, Mar. 23, 1981,, which is a continuation-in-part of Ser. No. 34,394, Apr. 30, 1979, Pat. No. 4,257,424. This application Dec. 6, 1982, Ser. No. 447,423
Int. Cl.[4] A61B *5/04*; A61N *1/04*
U.S. Cl. 128—640 **8 Claims**



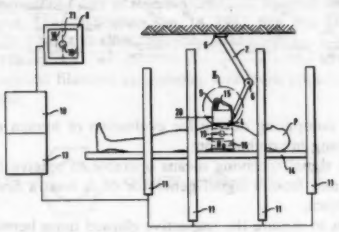
1. An assembly of medical electrodes comprising an extended sheet of dimensionally stable nonconductive substrate material, a stripe of conductive paint adhered to one side of said extended sheet and extending the length of said sheet, said sheet having a plurality of weakened portions spaced apart to define segments along the length of said sheet, the segments of said sheet occupying the spaces between said weakened portions including a broad heel section proximal one end of each segment and a narrow toe section proximal the other end of each segment, each said segment traversed by a film of electrolyte including conductive adhesive lying over said stripe, and lying over only said broad heel section.

4,543,959

DIAGNOSIS APPARATUS AND THE DETERMINATION OF TISSUE STRUCTURE AND QUALITY

Raimo Sepponen, Helsinki, Finland, assignor to Instrumentarium Oy, Finland

Continuation of Ser. No. 382,153, May 26, 1982, abandoned.
This application Jan. 25, 1985, Ser. No. 695,403
Claims priority, application Finland, Jun. 4, 1981, 811733
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—653 **11 Claims**



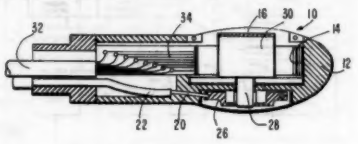
1. Diagnosis apparatus for simultaneously collecting information on tissue structure and quality of the tissues from a target, for example a human body, to be examined, said apparatus including means for transmitting ultrasonic pulses and for detecting and recording reflections from interface between the tissues, said reflections resulting from quick changes in acoustic impedance and being detected and recorded from a given target area determined by said means and selected for examination, means for processing the information obtained by said ultrasonic pulses from said target area and visually displaying the target area and the information, nuclear magnetic resonance means for collecting tissue information essentially simultaneously with the ultrasonic means from said selected area of said target under examination and establishing nuclear magnetic resonance sensitive tissue identification information from said selected area of said target area, said apparatus further including information processing means operatively connected with said nuclear magnetic resonance means for processing the tissue identification information obtained by said nuclear magnetic resonance means simultaneously with information collected by the ultrasonic means and displaying said tissue identification information along with the visual display of the information collected by said ultrasonic means, and means for effecting a magnetic field which is substantially homogeneous in said target area to be examined, said means for effecting a homogeneous magnetic field comprising an electromagnet including at least two annular magnetic elements disposed at spaced relationship with each other and about said ultrasonic transmitting means, said target to be examined being arranged to be disposed inside said magnetic elements with said target area to be examined positioned in the center area between said magnetic elements, said ultrasonic pulses transmitting and detecting means comprises an ultrasonic matrix sensor and said nuclear magnetic resonance means includes means about the sensor for effecting field gradients within the created homogeneous magnetic field and means about the sensor for transmitting radio-frequency electromagnetic pulses and for detecting nuclear magnetic resonance-signals created in said nuclear magnetic resonance-sensitive tissue identification zone by means of said pulses, a transfer unit including said ultrasonic matrix sensor and said means for transmitting radio-frequency pulses and for detecting nuclear magnetic resonance-signals being mounted to be freely transferable over said target under examination.

4,543,960

TRANSESOPHAGEAL ECHO CARDIOGRAPHY SCANHEAD

Norio Harui, Seattle, Wash., and Jacques Souquet, Meudon, France, assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Continuation of Ser. No. 484,003, Apr. 11, 1983, abandoned.
This application May 1, 1985, Ser. No. 728,445
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **2 Claims**



1. An ultrasonic scanhead adapted for insertion into the esophagus of a patient for use in transesophageal echo cardiography to produce two-dimensional ultrasound scans of said patient, comprising:

(a) A housing having a cylindrical cavity formed therein;

(b) An elongated, multi-element ultrasonic array, said array being comprised of a number of elongated piezoelectric elements having emitting surfaces arranged in a plane, said array having a scan axis which is perpendicular to the long axis of said elements, said array being mounted on a pulley within said cavity;

(c) Means for rotating said pulley within said housing, whereby said array will be rotated relative to said housing and in the plane of said elements around the axis of rotation of said pulley;

(d) Means adapted for connecting said means for rotating to an operator control remote from said housing; and

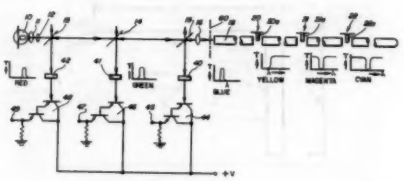
(e) Means for electrically connecting said array to an external ultrasound unit.

4,543,961

DATA TRANSMISSION SYSTEM

David C. Brown, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 14, 1983, Ser. No. 551,121
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—667 **34 Claims**



1. A system for transmitting data, which comprises:

a plurality of aligned optical fibers positioned end to end;

means for directing light into said optical fibers;

a plurality of selective wavelengths filter-mirror means interposed between the ends of said optical fibers, each of said filter-mirror means being operable to reflect only a selected color and to transmit other colors;

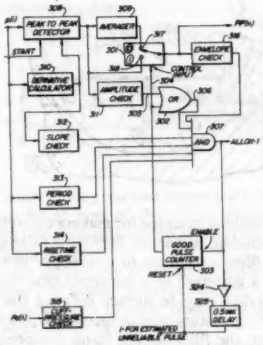
each of said filter-mirror means being movable relative to said optical fibers in response to a variation of a selected parameters, to vary the quantity of light being reflected by said filter-mirror, whereby variation of different selected parameters causes movement of corresponding selective wavelength filter-mirror means and concomitant reflection of corresponding selected colors; and

means for detecting the quantity and color of the light being reflected, whereby parameter variations are detected.

4,543,962
METHOD OF AUTOMATED BLOOD PRESSURE DETECTION

Richard Medero, Lutz; Rush W. Hood, Tampa; Howard P. Apple, Tampa, and Maynard Ramsey, III, Tampa, all of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jul. 9, 1984, Ser. No. 628,861
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—682 **4 Claims**



1. In an automatic oscillometric blood pressure system measurement method utilizing successive decremental arterial counterpressures to measure blood pressure complexes through detection of counterpressure oscillation, an improved detection method comprising:

(a) establishing a predetermined counterpressure above systolic pressure;

(b) decrementing said counterpressure in predetermined decrements to different pressure levels, each such pressure level being maintained for at least a predetermined duration;

(c) sensing more than one complex at a first predetermined number of pressure levels, and comparing successive complex peak amplitudes at each such level to detect onset of true blood pressure complexes; and

(d) after said detection of true complexes at a predetermined number of successive such pressure levels, commencing sensing but one complex at each level.

4,543,963
METHOD AND APPARATUS FOR DIFFERENTIATING ANTEGRADE FROM RETROGRADE P-WAVES AND FOR PREVENTING PACEMAKER GENERATED TACHYCARDIA

Lawrence J. Gessman, 1929 West Point Ct., Cherry Hill, N.J. 08003

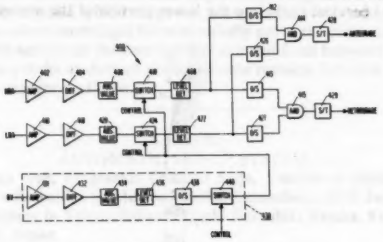
Filed Nov. 22, 1983, Ser. No. 554,179
Int. Cl.[4] A61B *5/04*; A61N *1/36*
U.S. Cl. 128—702 **33 Claims**

1. A method for detecting retrograde P-wave conduction from an A-V node through an atrium of a human heart, said method comprising the steps of:

(a) sensing a P-wave signal at a first location in said atrium;

(b) sensing said P-wave signal at a second location in said atrium, said second location being intermediate said first location and said A-V node;

(c) comparing the time at which said P-wave is sensed at said first location with the time at which said P-wave is sensed at said second location; and



(d) indicating the occurrence of a retrograde P-wave whenever said P-wave is sensed at said second location before it is sensed at said first location.

4,543,964
METHOD FOR TESTING FOR IMMUNE RESPONSES TO FOOD

James C. Breneman, 10571 Miller Dr., Galesburg, Mich. 49053

Filed Apr. 21, 1983, Ser. No. 487,065
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—743 **9 Claims**

1. A method of determining whether an individual has a Gell-Coombs Type I, II, III or IV immune response to an edible substance, said method including the steps of:

preparing a mixture of an edible food substance and a solution of non-toxic aprotic solvent and water, said mixture being sufficient to produce an immune response in an individual sensitive to said edible substance;

applying an amount of said mixture to the skin of an individual;

holding said amount of said mixture on the skin with means for preventing evaporation of said solution from the skin;

removing said means for preventing evaporation after a suitable time from applying said mixture to the skin; and

determining whether a Type II, III or IV immune response reaction has occurred.

4,543,965
METHOD AND DEVICE FOR MEASURING INTRAUTERINE PRESSURE

Isak Pack, Beer-Sheva; David Veintraub, Negev; Abraham Yarkoni, and Josef Merchuk, both of Beer-Sheva, all of Israel, assignors to Ben-Gurion University of The Negev Research and Development Authority, Beer-Sheva, Israel

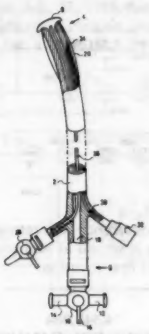
Filed Jun. 8, 1983, Ser. No. 502,166
Claims priority, application Israel, Jun. 13, 1982, 66047
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—748 **7 Claims**

1. A method for measuring intrauterine pressure during pregnancy and during labor prior to the rupture of the amnionic membrane, comprising the steps of:

providing an elongated catheter having at one end thereof at least one first inflatable membrane and pressure-transmitting means in the form of a second inflatable membrane for making pressure-transmitting contact with the amniotic membrane, said second inflatable membrane being connectable to a pressure monitor, said first inflatable mem-

brane serving for providing anchorage, inside the uterus, for said catheter and purchase for said second inflatable membrane;

introducing the end of said catheter via the vagina and the cervical canal into the lower portion of the uterus;



inflating said first inflatable membrane with a fluid, until said anchorage and said purchase are established;

inflating said second membrane with fluid, and establishing communication between said second membrane and said pressure monitor, and

monitoring said intrauterine pressure.

4,543,966

BIOPSY NEEDLE

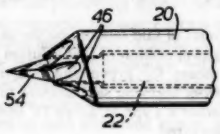
Abul B. M. A. Islam, Northolt, and David R. Bevan, Carshalton Beeches, both of England, assignors to Downs Surgical PLC, Surrey, England

Continuation of Ser. No. 384,757, Jun. 3, 1982, abandoned. This application May 16, 1984, Ser. No. 610,883

Claims priority, application United Kingdom, Jun. 10, 1981, 8117836

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—754 **16 Claims**



1. A biopsy needle for taking bone marrow biopsies comprising an elongate hollow needle having an open front end provided with a cutting edge and an open rear end, said hollow needle having throughout the major portion of its length a smooth uninterrupted cylindrical external surface of substantially constant diameter, and an elongated sample receiving chamber extending rearwardly from said open front end and defined by first and second cylindrical internal and integral sample-contacting surfaces, said first cylindrical internal surface being a portion of wider internal substantially constant diameter throughout a major portion of the length of said sample receiving chamber, and said second cylindrical internal surface being of narrower substantially constant internal diameter and defining the front end portion of said sample receiving chamber so that movement of a bone marrow biopsy into the narrower diameter front end portion and subsequent removal from the wider diameter portion is effected without any substantial crushing of the biopsy, said narrower diameter front end portion having an axial length in the range of 0.5 to 10 mm, there being an internal sample-retaining shoulder where said portion of narrower internal diameter adjoins said major portion of wider internal diameter, said cylindrical surfaces of wider and narrower diameters being coaxial and manipulating means provided at the rear end of said needle.

4,543,967

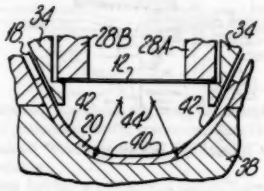
CIGARETTE MANUFACTURE

Francis A. M. Labbe, Neuilly-sur-Seine, France, assignor to Molins PLC, London, England

Filed Feb. 4, 1983, Ser. No. 463,851

Int. Cl.[4] A24C *5/18*

U.S. Cl. 131—84.3 **19 Claims**



1. A cigarette making machine for making cigarettes of oval cross-section, including means for forming a filler stream and for feeding the filler stream on to a wrapper web which is carried through a garniture by a garniture tape running on a garniture bed having a guide surface defining the cross-sectional shape of the garniture tape at successive positions along the garniture bed, the filler stream being compressed to the cross-section of the finished cigarette by filler shaping means engaging the top of the filler stream whereby the said shaping means, in combination with the guide surface of the garniture bed, forms the filler stream into the required oval cross-section; and including means for thereafter folding the wrapper web completely around the filler stream and for securing the wrapper web to form a continuous cigarette rod, the garniture bed having a first part including means to form the cross-sectional shape of the garniture tape and wrapper web, at the position at which the filler stream arrives on the web, into the form of a trough having an approximately flat central portion with side portions curved about two horizontally spaced centers of curvature, a second part including means to cause the cross-sectional shape of the garniture tape to change progressively in that the said centers of curvature of the curved side portions move closer together while the radius of curvature of each of said side portions remains substantially constant and a third part in the region of which the filler shaping means including means to progressively compress the filler stream, and the guide surface causes said central portion of the garniture tape and wrapper web to assume a curve of radius larger than the said radii of curvature of the side portions a the first and second parts of the garniture bed.

4,543,968

HAIR STYLING APPLIANCE

Masao Fukunaga, Matsubara, and Hiroshi Nonoguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00258, § 371 Date Mar. 15, 1983, § 102(e) Date Mar. 15, 1983, PCT Pub. No. WO83/00279, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 8, 1982, Ser. No. 486,294

Claims priority, application Japan, Jul. 15, 1981, 56-111502; Jul. 15, 1981, 56-111500

Int. Cl.[4] A45D *2/12*

U.S. Cl. 132—33 R **9 Claims**

1. A hair styling appliance which comprises:

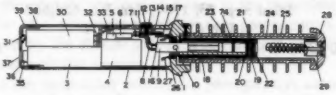
a hollow body having a battery chamber defined therein for replaceably accommodating at least one battery;

a tank housed within the body for accommodating liquefied inflammable gas;

a pressure regulator housed within the body and having a gas inlet and a gas outlet, said pressure regulator being positioned in abutting relation to the tank with the gas inlet in fluid connection with the interior of the tank;

a nozzle positioned within the body in fluid connection with the gas outlet, said pressure regulator being operable to regulate the pressure of the inflammable gas flowing therethrough towards the nozzle from the tank;

a burner having a gas supply port and a gas discharge port and carried by the body at one end thereof with the gas supply port and the gas discharge port positioned inside and outside the body, respectively, said gas supply port being communicated with the tank through the nozzle and the pressure regulator;



a curling unit having one end connected to the body with the gas discharge port of the burner positioned inside said curling unit, said curling unit also having a brush provided exteriorly thereof;

a means for igniting the inflammable gas when energized by the supply of power from the battery;

at least one catalyst element positioned within the curling unit adjacent the igniting means;

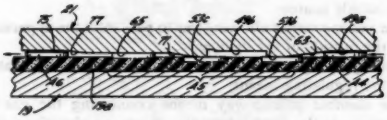
a manipulable switch assembly movable between first and second positions, said switch assembly, when in the first position completing not only an electric circuit between the battery and the igniting means, but also a fluid circuit between the nozzle and the burner, whereby the inflammable gas discharged from the discharge port of the burner can be ignited to heat the curling unit for hair styling, and said switch assembly, when in the second position, closing both of said electric circuit and said fluid circuit.

4,543,969

COIN SORTER APPARATUS AND METHOD UTILIZING COIN THICKNESS AS A DISCRIMINATING PARAMETER

James M. Rasmussen, Chicago, Ill., assignor to Cummins-Allison Corporation, Mount Prospect, Ill.

Filed May 6, 1983, Ser. No. 492,397
Int. Cl.[4] G07D *3/06*
U.S. Cl. 133—3 A **20 Claims**



1. A coin sorter apparatus for sorting coins by denomination using coin thickness as a discriminating parameter, said apparatus comprising:

a rotating disk having a first resilient surface for receiving a mixed denomination of coins and imparting a rotational movement to said mixed denomination coins;

a stationary disk having its underside parallel with said first resilient surface of said rotating disk with ridges and recesses on the stationary disk underside to selectively direct the rotating mixed denomination coins into a region between the two disks,

first selected areas of the ridges and recesses in said stationary disk allowing coins of distinct thicknesses to occupy distinct radial positions on said rotating disk as the coins on said rotating disk rotate beneath said stationary disk,

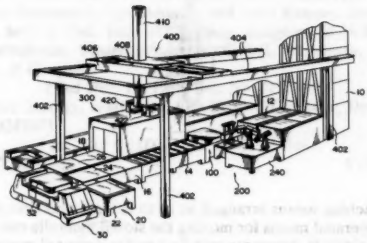
second selected areas of the ridges and recesses in said stationary disk which cooperate with said first selected areas to allow centrifugal force to radially move the coins along the surface of the rotating disk and exit from between the two disks at distinct points of coin rotation for each denomination of coin.

4,543,970

AUTOMATIC SET-UP SYSTEM

Akihiko Noh, Chigasaki; Yoshiaki Saijo, Yokohama; Shinichi Sato, Kawasaki, and Ichiro Tanaka, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 17, 1984, Ser. No. 581,417
Claims priority, application Japan, Feb. 21, 1983, 58-26236; Oct. 18, 1983, 58-195073; Oct. 18, 1983, 58-195076
Int. Cl.[4] B08B *1/02*
U.S. Cl. 134—62 **12 Claims**



1. An automatic set-up system for setting up a work to be processed by a flexible manufacturing system automatic machine tool, comprising:

a pallet on which said work is mounted;

a setting table on which said pallet having said work thereon is placed;

a convey unit having grip means for sequentially gripping and conveying said pallet and the work onto said setting table;

a clamp mounted on said pallet to clamp and fix the work on said pallet;

a cleaner for cleaning the work and said pallet which are fixed together by said clamp; and

feeding means for delivering the work and said pallet which are fixed together by said clamp to the automatic machine tool and for feeding a processed work and said pallet to said cleaner.

4,543,971

UMBRELLA HOLDER

Vladimir Sirota, 263 Congressional Lane, #711, Rockville, Md. 20852

Filed Jun. 20, 1983, Ser. No. 506,423
Int. Cl.[4] A45B *17/00*
U.S. Cl. 135—16 **4 Claims**

1. An umbrella holder located in an automobile, for receiving a closed umbrella thereinto including a selectively actuated automatic mechanism for presenting an opened umbrella in a position permitting removal for manual use outside the automobile for conveyance and for receiving and storing the umbrella when returned to the holder, comprising in combination

an umbrella with interengaging elements,

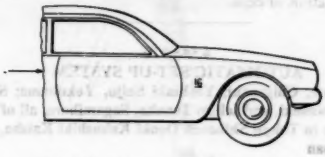
a substantially vertical holder for storing the umbrella with the interengaging elements in mating position,

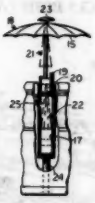
first motor-operated means for moving a stored umbrella vertically upwardly out of the holder into a position ac-

cessible for manual removal and for moving the umbrella vertically downwardly into the holder,

second motor operated means for opening the umbrella outside the holder and closing the umbrella outside the holder, (for moving the umbrella vertically downwardly into the holder, motor-operated means for and)

grasping means on the holder for grasping the umbrella in closed position in the holder, and





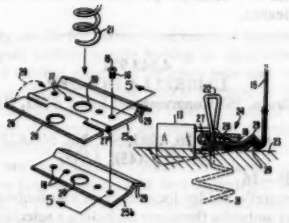
switching means arranged so as to actuate said first motor-operated means for moving the stored umbrella out of the holder, to deactuate said first motor-operated means and actuate said second motor-operated means when the umbrella has been moved out of the holder for opening the umbrella, to actuate said second motor-operated means for closing the umbrella outside the holder, to deactuate said second motor-operated means and actuate said first motor-operated means when the umbrella has been closed for moving the closed umbrella into the holder.

4,543,972

LOCKABLE TENT STAKE

James F. Bennett, and Edward A. Bennett, both of 11181 E. HJ Ave., Galesburg, Mich. 49053

Filed Jul. 8, 1983, Ser. No. 512,030
Int. Cl.[4] A45F *1/16*
U.S. Cl. 135—118 **4 Claims**



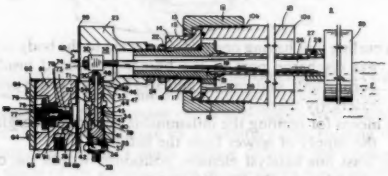
1. A lockable tent stake, comprising, in combination, a clamp for clamping to a lower edge of a tent, a ground stake for insertion through said clamp and into the ground, and a padlock for padlocking through said clamp and through said stake for preventing removal of said ground stake from said ground and said clamp; said clamp comprising a pair of clamp plates between which said tent lower edge is clamped, headed removable fastening means each received in mating holes of said plates for securing said plates together and holding said clamp in a locked position, and means to prevent access to said headed removable fastening means; said ground stake comprising a strong metal rod bent at one end into a long spiral for screwing into said ground and being bent at its other end into a large handle loop; and said means to prevent access being a cover plate hinged to one of said pair of clamp plates to pivotally cover the heads of said headed means, a stake-receiving opening in each said pair of clamp plates and said cover plate, said stake-receiving openings being aligned with each other when said cover plate is pivoted over to cover said heads; and said padlock being inserted through said ground stake handle loop and also through all said aligned stake-receiving openings.

4,543,973

LIQUID LEVEL CONTROL APPARATUS AND METHOD

Giong Ho, 4328 E. 67th St., No. 680, Tulsa, Okla. 74136

Filed Sep. 25, 1984, Ser. No. 654,652
Int. Cl.[4] F16K *31/34*
U.S. Cl. 137—1 **17 Claims**



1. A gas operated liquid level control apparatus comprising:

sensing means for sensing the level of liquid in a vessel;

control means for operably connecting the sensing means to a means for regulating the level of liquid in the vessel;

the control means including a housing means;

the control means being operable either in a snap-actor mode, which substantially maintains the liquid level in the vessel between predetermined levels, or a throttling mode, which substantially maintains the liquid level in the vessel at a predetermined level;

the control means determining operation in a snap-actor mode or a throttling mode;

means for flowing a gas through the control means;

the sensing means determining whether the gas flows to the regulating means, to a means for venting the gas away from the apparatus, or both;

the housing means being comprised of a gas inlet means, venting means, regulating connection means, member passageway means, control connection means, diaphragm control means, and orifice control means;

the gas inlet means supplying gas to the apparatus from an outside source;

the venting means allowing gas to pass from the apparatus to the outside of the device;

the regulating connection means connecting the apparatus to the regulating means;

the member passageway means connecting the gas inlet means to the diaphragm control means and orifice control means;

the control connection means connecting the control means to the gas inlet means, the regulating connection means, and the diaphragm control means for the entrance and exit of gas to and from the control means;

the diaphragm control means being comprised of a chamber on the housing means;

the chamber abutting a diaphragm;

the diaphragm control means collecting gas under pressure in the chamber;

the orifice control means controlling the flow of gas from the member passageway means to the venting means;

the orifice control means capable of being sealingly engaged by the sensing means;

the control means being comprised of booster body means, diaphragm means and engaging means;

the engaging means holding the booster body means and diaphragm means in a substantially air tight connection with the housing means;

the engaging means capable of being loosened or removed from the housing means to allow rotation of the booster body means and/or the diaphragm means, and then re-tightened or re-engaged with the housing means;

the booster body means being comprised of passageways, shuttle valves, and vents;

the booster body means only being operable in the snap-actor mode;

the passageways being aligned with the control connection means while in the snap-actor mode, but not being aligned with the control connection means in the throttling mode;

while in the snap-actor mode, the passageways being blocked by the shuttle valves when the gas is allowed to pass through the venting means;

while in the snap-actor mode, the passageways connecting the gas inlet means and regulating connection means by the control connection means when gas is prevented from passing through the venting means by the sensing means;

while in the snap-actor mode, the vents venting the passageways to the exterior of the booster body means when the shuttle valves are forced into a position allowing passage of gas through the passageways of the booster body means;

the shuttle valves being forced into such position by the action of the diaphragm means.

4,543,974

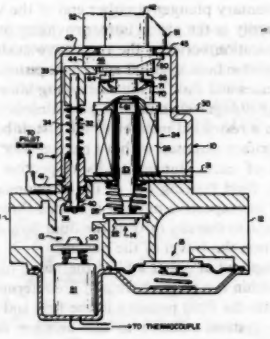
GAS VALVE WITH COMBINED MANUAL AND AUTOMATIC OPERATION

Paul Dietiker, Redondo Beach; Yong C. Kim, Los Angeles, both of Calif.; Marvin D. Nelson, St. Louis Park, and Elwyn H. Olson, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 14, 1982, Ser. No. 531,963

Int. Cl.[4] F23D *5/16*; F16K *31/02*

U.S. Cl. 137—66 **19 Claims**



1. A manually operated fuel valve comprising,

a valve body having an inlet opening adapted to be connected to a source of fuel under pressure and an outlet opening adapted to be connected to a fuel consuming apparatus,

safety valve means and a control valve means connected in series in said valve body between said inlet and outlet openings, electromagnetic actuator means connected to said control valve means,

a pilot valve means adapted to control the flow of fuel to a pilot burner,

manual operator means mounted on said valve body,

first means released by said manual operator means when in a first position and connected to said pilot valve means to provide for separate manual operation of said pilot valve means and said safety valve means, when said first means is pushed downward to first open said pilot valve means to allow the flow of fuel to said pilot burner and further downward movement of said first means will permit said pilot valve to engage and open said safety valve means until a pilot frame is established at the pilot burner to maintain said safety valve means open independent of said first means and then allowing said first means to return to a pilot valve position, and

further means connected to said manual operator means when in said first position to hold said control valve closed regardless of the energization of said electromagnetic actuator means to open said control valve.

4,543,975

FLUID PRESSURE REGULATING VALVE MECHANISM

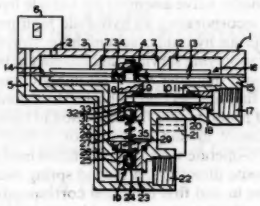
Wilhelm Bachmann, Langenhagen, and Axel Kemner, Isernhagen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH, Hannover, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 562,765

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247071

Int. Cl.[4] G05D *16/00*; F16K *31/365*

U.S. Cl. 137—85 **9 Claims**



1. A fluid pressure regulating valve for use with a receiving device, said regulating valve comprising:

(a) a valve housing;

(b) a diaphragm piston reciprocally movable within said housing;

(c) a control chamber disposed adjacent a first side of said diaphragm;

(d) an outlet chamber disposed adjacent a second side of said diaphragm piston opposite said first side;

(e) a valve stem secured to said diaphragm piston for coincident movement therewith;

(f) a discharge tube resiliently connected on a first end to said valve stem and on a second end to said housing such that, movement of said diaphragm piston is substantially dampened by such resilient connection, said discharge tube further having a hollow center portion for passage of fluid pressure therethrough to atmosphere, such resilient connection of said discharge tube being achieved by a first flexible gasket disposed on said first end of said discharge tube and held in a gasket slot formed in said valve stem, and a second flexible gasket disposed on said second end and held in a bushing secured to said housing;

(g) pressure supply means for pressurizing said control chamber to a preselected fluid pressure level;

(h) inlet chamber formed in said housing and in communication with said pressure supply means; and

(i) valving means formed partially on said valve stem for controlling the flow of such fluid pressure between said

outlet chamber and said discharge tube, and for controlling the flow of such fluid pressure between said inlet chamber and said outlet chamber.

4,543,976

CONTROL VALVES FOR VEHICLE HYDRAULIC SYSTEMS

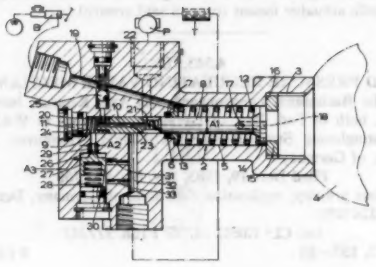
Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Division of Ser. No. 635,475, Jul. 30, 1984, Pat. No. 4,503,876, which is a continuation of Ser. No. 355,343, Mar. 8, 1982, abandoned. This application Jan. 9, 1985, Ser. No. 690,037

Claims priority, application United Kingdom, Mar. 11, 1981, 8107693

Int. Cl.⁴ G05D *16/10*

U.S. Cl. 137—101 **2 Claims**



1. An unloader valve assembly for vehicle hydraulic systems of the type incorporating an hydraulic high pressure pump, a reservoir and an hydraulic accumulator storing accumulator pressure for supplying services and adapted to be charged from said pump, said unloader valve assembly comprising a piston movable in first and second opposite directions, a first spring biassing said piston in said first direction in opposition to accumulator pressure in said accumulator, a flow control valve adapted to co-operate with said piston and movable in first and second opposite directions, a second spring biassing said flow control valve in said first direction corresponding to said first direction in which said piston is biassed by said first spring, means defining a control chamber supplied from said pump, pressure in said control chamber acting on said flow control valve in a direction corresponding to the direction in which said flow control valve is biassed by said second spring, and pump pressure acting on said flow control valve in the opposite said second direction, and on said piston in said first direction, an outlet for connection to said reservoir, a pilot dump valve movable between an open position and a closed position for controlling communication between said control chamber and said outlet, and a third spring for biassing said dump valve into said closed position to isolate said control chamber from said outlet, pressure in said control chamber acting on said dump valve in opposition to said third spring to urge it into open position, and means for determining a cut-out pressure for said accumulator comprising said third spring, and means for determining a cut-in pressure for said accumulator comprising said first spring, said accumulator being charged by said pump through passage means including a substantially unrestricted passage in said flow control valve, and said control chamber, said control chamber being exposed to accumulator pressure during charging of said accumulator, and at said cut-out pressure said dump valve opens in response to said control pressure to connect said control chamber to said outlet, such that said flow control valve and said piston move against said first and second springs, said flow control valve being moved into an unloading position, in which it is maintained by said accumulator pressure acting on said piston, said dump valve subsequently closing, and following reduction of said accumulator pressure due to operation of said services at said cut-in pressure, said first and second springs move said piston and said flow control valve in said first direction to establish communication between said accumulator and said pump.

4,543,977

VALVES

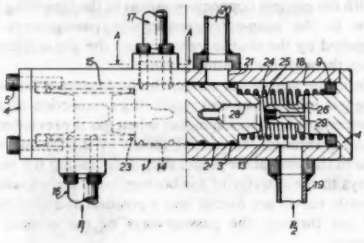
Ronnie A. Arav, Bolton, England, assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 27, 1983, Ser. No. 545,892

Claims priority, application United Kingdom, Oct. 30, 1982, 8230926

Int. Cl.⁴ G05D *16/18*

U.S. Cl. 137—115 **1 Claim**



1. In a balance valve for maintaining two fluid pressure systems at a predetermined pressure relative to one another, including a valve body with a piston bore, a piston received in the bore for reciprocal movement therein, the piston being subjected at opposite ends to the fluid pressure in the first and second fluid pressure systems, which systems are isolated from one another by the piston, and a relief line for each of the fluid pressure systems, the combination comprising:

each relief line is linked in fluid communication with the piston bore such that each relief line is closed when the piston is substantially centered in operating position;

means associated with the piston at each end thereof, including a cushioning bore in either end of the piston and a complimentary plunger at either end of the valve extending inwardly in the piston bore, providing restricted fluid communication between the respective cushioning bores and the piston bore at either end of the piston as the piston reciprocates and fluid in the cushioning bore opposite the incoming plunger cushions the piston motion as the fluid passes in a restricted manner to the piston bore;

a control oriface disposed within a passageway leading from the end of each plunger to its respective piston bore whereby fluid flowing out of the cushioning bore upon entry of its respective plunger is forced through the control oriface to thereby throttle the fluid flow therethrough and cushion the travel of the piston;

a spring disposed at either end of the valve to position the piston within the piston bore at a predetermined position to regulate the fluid pressure in the first and second fluid pressure systems relative to one another as well as to return the piston to such position after its movement caused by a pressure differential in the fluid pressure system;

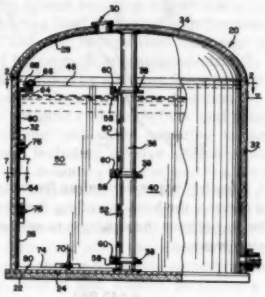
whereby any imbalance in the forces in the fluid pressure systems acting on the piston causes the piston to move away from the higher force and thereby connect the relief line, associated with the higher fluid pressure end of the piston bore to thereby effect reduction in the fluid pressure acting on that side of the piston to balance out the forces acting on the piston.

4,543,978

SINGLE TANK FOR DUAL THERMAL ENERGY STORAGE WITH INTERNAL MOVABLE PARTITION

Royce J. Laverman, South Holland, and Luciano F. Bertolazzi, Wheaton, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jul. 25, 1983, Ser. No. 516,594
Int. Cl.[4] E03B *11/00*
U.S. Cl. 137—255 **15 Claims**



1. A liquid storage tank for storing two separate volumes of liquid at different temperatures, comprising:

an enclosed roofed tank which is circular in horizontal section about a vertical axis;

a vertical radial stationary partition in the tank;

a vertical radial partition in the tank having a top edge out of sealing contact with the roof and means mounting the partition to be rotatably movable about the vertical axis of the tank by a difference in hydrostatic force on each side of said partition;

means preventing liquid flow between opposite sides of the movable partition and opposite sides of the stationary partition;

means for feeding a liquid to a first side of the stationary partition and withdrawing liquid therefrom; and

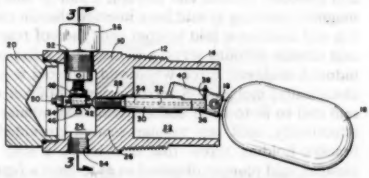
means for feeding a liquid to a second side of the stationary partition and withdrawing liquid therefrom.

4,543,979

LIQUID LEVEL CONTROL HAVING IMPROVED INSTRUMENT AIR VALVE

Daniel C. Olmsted, and Quin D. Kroll, both of Houston, Tex., assignors to Dover Corporation, Tulsa, Okla.

Filed Jul. 24, 1984, Ser. No. 633,848
Int. Cl.[4] F16K *43/00, 31/18, 33/00*
U.S. Cl. 137—315 **7 Claims**



1. For use with a liquid level control having a body with an actuating member isolated from the liquid and which is displaced in response to changing liquid levels, a valve for regulating the flow of instrument control air through the body, the valve comprising:

a valve body including means for attachment to a liquid level control body, the valve body having means at the first end for connecting a source of instrument control air thereto, the body having a flow passageway therethrough, the valve body having a recess in the second end coaxial and communicating with said flow passageway, and having, within said recess, an annular valve seat surrounding said flow passageway, and having at least one vent opening adjacent the second end of the valve body communicating with said recess;

a cylindrical guide member for external diameter less than the internal diameter of said valve body recess, and having an integral enlarged diameter portion at one end, and having a cylindrical passageway therethrough, the guide member being received in said valve body recess, the guide member enlarged diameter portion being secured to said valve body and serving to close off said recess;

an elongated plunger having inner and outer ends, the inner end portion being cylindrical and of external diameter slightly less than said guide member cylindrical passageway and being telescopically received in said passageway, the plunger being longitudinally movable towards a valve open and a valve closed portion;

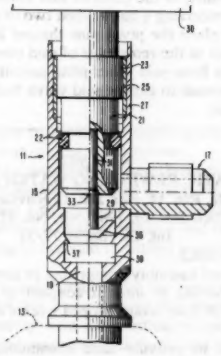
a valve seat element of resilient material and of diameter less than said plunger and being affixed to said plunger inner end and engagable with said valve body valve seat, the outer end of said plunger being engaged by the level control actuating member to move said plunger relative to said valve seat in response to changing fluid levels, the valve when opened providing air flow through said passageway and exteriorly of said guide member and out said valve body vent opening, the said plunger being removable from said guide member without disassembling of said guide member whereby said valve seat element is easily inspected and repaired.

4,543,980

VALVE FOR PRESSURIZED CONTAINERS

John A. van der Sanden, 5 Beethovenlaan, Waalre, NL-5583XR, Netherlands

Continuation-in-part of Ser. No. 523,563, Aug. 16, 1985, , which is a continuation-in-part of Ser. No. 445,230, Nov. 29, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,307
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337197
Int. Cl.[4] B65B *3/04*
U.S. Cl. 137—315 **15 Claims**



1. A valve for a pressurized container comprising a blocking element, said blocking element being adapted to occupy an initial location whereby fluid can move in and out of said container past said blocking element, said valve and blocking element being further configured such that said blocking element can be irreversibly moved to a final location in which said valve permits escape of fluid under pressure exerted from the inside of the container, but which automatically closes in

response to exposure to an external pressure greater than the pressure inside the container, said blocking element comprising at least one flexible radially extending arm whose lateral radius is reduced upon movement of said blocking element from said initial location to said final location, and which at least one arm automatically expands within said final location to prevent return of said blocking element to said initial location.

4,543,981

SLIDING GATE VALVES

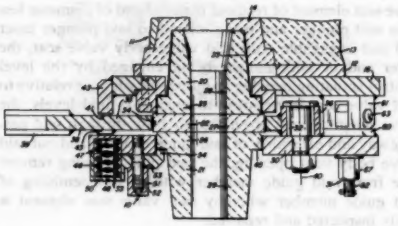
Kenneth W. Bates, Chesterfield, and Norman H. Watts, Sheffield, both of England, assignors to USS Engineers & Consultants, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 427,350

Claims priority, application United Kingdom, Nov. 26, 1981, 8135745; Nov. 26, 1981, 8135746

Int. Cl.⁴ F16K *43/00*

U.S. Cl. 137—315 **6 Claims**



1. A sliding gate valve for use in the pouring of molten metals including a mounting plate, a support plate, and orificed refractory valve bodies carried by each of the respective plates and being spring pressed into mutual sealing contact, one of said valve bodies serving as a gate and being movable with respect to the other valve body for controlling the flow of metal through the valve, and means forming attachments disposed at spaced locations about the valve for releasably securing said plates together, each of said attachments comprising a clevis mounted on one of said plates a pivot pin being received in said clevis and an eyebolt having its eye at one end pivotally connected to said pivot pin and a shaft extending through an associated opening in the other of said plates, said shaft being threaded and receiving a nut, at least two of said clevises being positioned to place the pivot pins thereof in axial alignment; and the eyebolt in the remainder of said clevises being swingably releasable from said other plate permitting said plates to be pivotally spread to expose said valve bodies for inspection or replacement.

4,543,982

AUTOMATIC REWINDING WATER HOSE REEL

Eddie B. Wolfe, Rte. 14, Box 200, Greenville, Tenn. 37743

Filed Jan. 19, 1984, Ser. No. 572,065

Int. Cl.⁴ B65H *75/34*

U.S. Cl. 137—355.2 **6 Claims**

1. A hose reel assembly comprising in combination:

a housing having an interior adapted to receive therein a plurality of hose wraps looped over a central supporting drum,

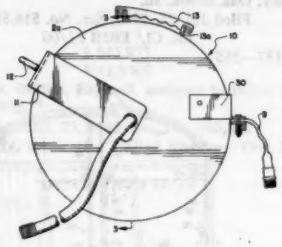
inlet means to provide fluid communication between a source of water and the hose disposed thereon,

a hose outlet extending through an opening within the housing,

squeegie means sensitive to fluidic pressure of the water system whereby in the absence of fluidic pressure said squeegie means is enabled so that when the hose is retracted back into said housing water is purged from the hose,

said squeegie means being assisted in purging by means of a spring biasing between said hose supporting drum and a stationary axle during the retraction period, and

said squeegie means includes a bracket disposed on an outer face of said housing having a radially outwardly extending



wiper, a further wiper depending from said first wiper and biased thereto, the hose extending therebetween, whereby said biasing allows the squeegie to operate in the absence of water pressure.

4,543,983

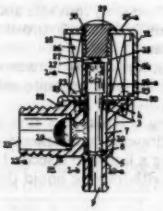
O-RING SOLENOID WATER VALVES

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 264,058, May 15, 1981, Pat. No. 4,441,687. This application Jun. 4, 1982, Ser. No. 384,799

Int. Cl.⁴ F16K *31/06*

U.S. Cl. 137—356 **3 Claims**



1. A water valve comprising:

a valve housing provided with fluid inlet and outlet port means including a valving means and means for actuating said valving means in an operable relationship with an elongated plunger movable by a solenoid spaced atop thereof and secured thereto, said solenoid including a coil with a bore passing therethrough between a first top end and a second bottom end thereof, a pair of short tubular magnetic sections in said bore inserted therein one in said top and another is said bottom ends thereof respectively, said tubular sections serving as magnetic poles subject to induced magnetic force when said solenoid is energized electrically, including a ferromagnetic bracket covering said coil so as to be in contact with said tubular sections structurally, said top tubular section provided with a bracket holding screw that doubles as a stop for said plunger, said plunger disposed so as to have a first top end thereof enter said bore of said coil partway inwardly adjacent said stop forming an air gap therebetween when said solenoid coil is not energized electrically while a second bottom end thereof enters a coaxial bore of said valve housing provided with a frictionally secured valving seal, means to separate a valve operating section containing said solenoid from a fluid valving section containing said valving means by the use of a seal spaced therebetween and secured sealably to prevent fluid flow between

said valve operating and said valving sections respectively, a small spring inside said first top plunger end abutting said stop, said valving means further including a side port for fluid supply to said housing bore and a bottom fluid discharge port directly opposite to said bore of said coil but substantially in line therwith so that both said fluid valving and said operating sections function during a position change of said plunger from a first normally closed to a second open position when said solenoid coil is energized electrically to exert magnetic force capable of plunger lifting against said stop while closing said air gap thereby permitting fluid communication between said side fluid supply and said bottom fluid discharge ports until said solenoid becomes de-energized electrically to render valve normally closed by a biasing force said small spring exerts in opposite direction to the direction the magnetic force of said solenoid coil exerts over said plunger,

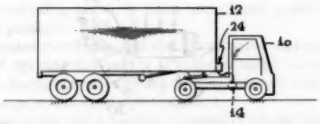
means for attaching said valve actuating section to said valving section including a valve assembly bracket that doubles as valve mounting bracket, said bracket formed so as to provide a support for a tubular sideways protruding external section of said side port by way of an opening in a vertical leg thereof while a first horizontal section of said bracket formed adjacent thereto on a 90 degree angle is firmly secured therein by way of corresponding holes in said housing, atop of said washer, including a clearance hole for said plunger in said horizontal section, and an adjacent vertical center section slightly offset on a side thereof, opposite to said vertical bottom leg, formed again on a 90 degree angle relative to said first horizontal section, including a set of valve mounting holes in said vertical center section, and an adajcent second horizontal section on top of said bracket bent on another 90 degree angle from said vertical central section so as to complete a magnetic pathway for opposing magnetjc poles of said solenoid, including a central mounting opening in said top of said bracket adaptable of receiving a plunger stop in final assembly of the valve, said solenoid spaced between said horizontal bracket sections including said tubular sections as inserts, and a first insert spaced inside said bore of said solenoid adjacent said first horizontal bracket section surrounding said plunger of said first valve actuating section while a second insert is spaced inside said bore opposite said first insert adajcent said second horizontal bracket section provided with said plunger stop on top thereof.

4,543,984

TRUCK TRAILER BRAKE AIRLINE LOCK

John M. Murray, 8633 Delmonico Ave., Canoga Park, Calif. 91304

Filed Sep. 9, 1983, Ser. No. 530,530
Int. Cl.[4] F16K *35/00*; B60T *11/00*
U.S. Cl. 137—385 **8 Claims**



1. A truck trailer brake air line lock comprising:

a housing enclosing a space, said housing being for mounting on a truck trailer, said housing having a wall therein;

first and second air line valves, each of said first and second air line valves having an inlet and having an outlet, said first and second air line valves being positioned within said enclosed housing;

first and second brake air line disconnect fittings rigidly connected to said housing and respectively connected to said inlets of said first and second valves, first and second trailer air lines respectively connected to said outlets of said first and second valves and extending out of said housing;

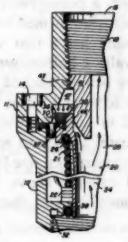
connection means between said first and second valves for operating said first and second valves together, an operating handle connected to said valve operating means and locking means connected to said valve operating handle, said locking means and said handle being positioned on the side of said dividing wall away from said valve to permit manual access to said locking means and said manual operating handle, said locking means being for disconnecting said manual operating handle from said valve operating means when said locking means is in the locked position and for connecting said manual handle with said valve operating means when said locking means is in the unlocked position so that said air lines can be selectively locked in the valve closed position to inhibit trailer brake actuation.

4,543,985

PRESSURE REGULATOR

Mark Healy, and Jerry D. Gerdes, both of Orlando, Fla., assignors to Senniger Irrigation, Inc., Orlando, Fla.

Continuation of Ser. No. 523,925, Aug. 17, 1983, abandoned.
This application Nov. 2, 1983, Ser. No. 547,976
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—505.25 **5 Claims**



1. A fluid pressure regulator for adjusting the fluid passing through a pipe comprising in combination:

a housing having a passageway therethrough;

a throttling stem slidably mounted in said housing passageway and having a passageway therethrough;

spring biasing means mounted between said throttling stem and the housing to bias said throttling stem relative to said housing;

a throttling stem seat attached in the passageway of said housing and having a passageway therethrough and having said throttling stem end portion extending thereinto for adjusting the passageway through said throttling stem seat to adjust fluid pressure between the input and output of said pressure regulator; and

a pressure controller member mounted in said housing passageway and extending in one end of said throttling stem for dampening oscillations in said throttling stem by limiting access of fluid in said system to a chamber including a surface area on one end of said throttling stem, said pressure controller member forming an annular chamber between said housing and the top surface of said throttling

stem and said pressure controller member and having a reduced passageway into said chamber from said passageway through said housing to thereby slow the flow of fluid into said chamber and dampen oscillations in said throttling stem, and in which said passageway into said chamber formed by said pressure controller member is an annular passageway between said pressure controller member and said internal surface of said throttling stem.

4,543,986

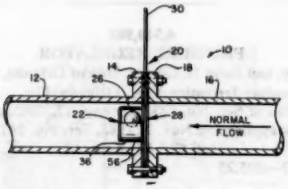
BALL CHECK VALVE AND PLATE

Thomas E. Byrne, P.O. Box 80123, Midland, Tex. 79709

Filed May 18, 1984, Ser. No. 611,830

Int. Cl.[4] F16K *15/04*

U.S. Cl. 137—515.7 **13 Claims**



1. A check valve for insertion between confronting adjacent flanges of a flow line, comprising:

a vertical plate member, a passageway formed through said plate member, an enclosure formed on one side of said plate member; said enclosure has a rear wall spaced from said plate member, sidewalls, a bottom wall, and a top wall, one end of said enclosure being attached to said plate member, said rear wall is affixed to and forms part of said enclosure; a valve seat formed in said top wall; the interior of said enclosure communicates with said aperture, a ball located externally of said enclosure of a size for seating on the valve seat; said rear wall extends above said seat and is bent towards said plate member and thereby captures the ball adjacent to the seat.

4,543,987

RELIEF VALVE

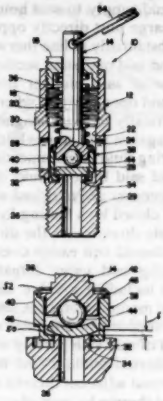
Charles E. Ekeleme, Jr., Durham, and Rabian M. Martin, Hurdle Mills, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1984, Ser. No. 604,675

Int. Cl.[4] F16K *17/04*

U.S. Cl. 137—540 **5 Claims**

1. In a relief valve comprising a body having an inlet port formed therein; a chamber intersecting said inlet port, an annular valve seat formed on said body adjacent the intersection of said chamber and said inlet port; at least one exhaust port formed through said body leading outwardly of said chamber; a poppet assembly disposed within said chamber and movable between a first position in engagement with said valve seat and a second position out of engagement with said valve seat, said poppet assembly comprising an elongated stem member, a seal element engageable with said valve seat, and self-centering means acting between said stem member and said seal element; and a spring biasing said poppet assembly into engagement with said valve seat; the improvement wherein said seal element comprises a metallic disc of unitary composition sealingly engageable with said valve seat, and said valve seat is defined by a annular projection upstanding from said body and having a substantially flat upper surface engageable by said disc, said disc being capable of deflecting under the influence of said



biasing force to cause said disc to contact only the inner edge of said annular valve seat.

4,543,988

STOP WHICH SETTLES IN A DEVICE BORE

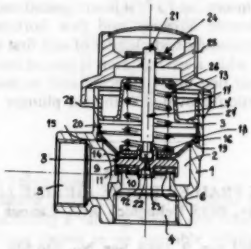
Jean L. Huveteau, Fressenneville, France, assignor to S.A. Robinetterie, S.F.R., Fressenneville, France

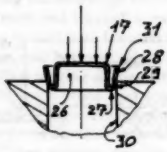
Filed Jun. 7, 1983, Ser. No. 501,827

Claims priority, application France, Jun. 9, 1982, 82 10540

Int. Cl.[4] F16K *17/04*

U.S. Cl. 137—542 **13 Claims**





7. A valve having a body, a chamber, a plurality of channels into said chamber including an inlet channel, an outlet channel and a central channel defined by a bore in the body, a valve element controlling communication between the inlet and outlet channel, a diaphragm supporting said valve element and being supported in the bore, a stop member tightly fitted in the bore, a spring positioned between the stop member and the diaphragm, said stop member including a centering dish receiving one end of the spring and a skirt having a first end

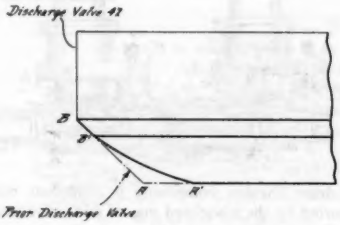
connected to an edge of said dish, said skirt having a peripheral wall which extends concentrically and axially with respect to the dish, the first end having a diameter which adusts itself practically without play in the bore and the skirt having a second free end with a diameter, prior to positioning of the stop in the bore, which is larger than that of the bore so that, upon placement of the stop in the bore, the peripheral wall of the skirt is compressed by the walls of the bore and thereafter, by reaction, is forcibly pressed against the walls of the bore.

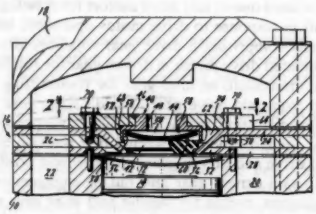
4,543,989

DISCHARGE VALVE ASSEMBLY FOR REFRIGERATION COMPRESSORS

E. William Lorson, Fairborn, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 318,155, Nov. 4, 1981, abandoned. This application Feb. 13, 1984, Ser. No. 578,989
Int. Cl.⁴ F16K *15/02*
U.S. Cl. 137—543.19 **10 Claims**





1. An improved discharge valve assembly for a compressor having means defining a compression chamber, said discharge valve assembly overlying said chamber and comprising:

a valve plate assembly having a surface facing said chamber and means defining a conical discharge passage including a portion defining a discharge valve seat;

a discharge valve positioned within said discharge passage and movable between open and closed positions within said passage;

stop means overlying said discharge valve and operative to limit opening movement of said discharge valve whereby said discharge valve restricts flow through said discharge passage when in an open position,

said discharge valve having a generally planar inner surface facing said chamber and positioned in substantially coplanar relationship with said valve plate surface when said discharge valve is in a closed position and including

a conical peripheral surface portion generally complimentary in shape to and sealingly engageable with said valve seat to effectively close said discharge passage when said valve is in a closed position and

an arcuate peripheral surface portion adjoining said conical portion and extending radially inwardly away from said valve seat to said inner surface, said arcuate surface portion being spaced from said valve seat when said valve is in a closed position, the locus of the centers of curvature of, said arcuate surface portion lying on a single circle whereby the restriction to flow through said discharge passage resulting from the limited opening movement of said discharge valve is reduced and the minimum flow area through said discharge passage when said valve member is in a fully open position is increased; and

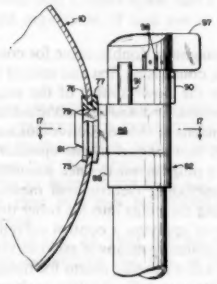
biasing means for biasing said conical peripheral surface portion into engagement with said valve seat.

4,543,990

IRRIGATION VALVE

Guy A. Meuleman, Rupert, Id., assignor to Aqua Control, Inc., Rupert, Id.

Filed Jul. 5, 1983, Ser. No. 511,657
Int. Cl.⁴ F16K *37/00*
U.S. Cl. 137—556 **17 Claims**



1. A valve assembly for regulating the flow of liquid through an opening in the side of a generally horizontal pipe comprising

an elastomeric gasket insertable into the opening in the pipe, said gasket having flange portions inside and outside of the pipe in its mounted position and having a central generally rectangular opening alignable with the opening through the pipe for receiving a valve housing;

a generally T-shaped valve housing having a hollow protruding portion shaped to extend into and engage said central opening in said gasket, the cross arms of said housing comprising a hollow, tubular member open at both ends,

said gasket and housing being mountable in the pipe opening such that said arms of said housing lie in a generally vertical plane with one arm higher than the other; and

a tubular, hollow valve member slidably received in the arms of said housing,

said valve member having an enlarged portion at the higher end to limit the insertion of said member into said housing, and

means defining a flow opening through the side wall thereof, said opening being axially spaced from said enlarged portion so as to lie in the same plane as said hollow protruding portion of said housing,

said valve member being selectively rotatable to a plurality of positions in which the opening in said valve member is completely aligned, partially aligned and totally non-aligned with the hollow interior of said protruding portion and the opening in said pipe to thereby select the size of passage available for liquid flow.

4,543,991

ELECTROMAGNETIC DOUBLE-VALVE FOR CONTROLLING THE FLOW OF TWO DIFFERENT MATERIALS

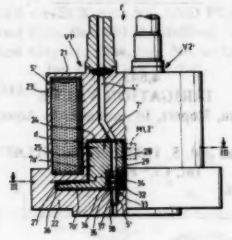
Franz Fuchs, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,643

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230162

Int. Cl.⁴ F16K *31/10*

U.S. Cl. 137—595 **12 Claims**



1. An electromagnetic double-valve for controlling the flow of two materials, comprising first and second individual valves each serving for the flow control of the respective material, valve housing means, first and second armature means including valve plug means in the respective housing means of each individual valve, first magnet means operatively arranged for holding the valve plugs in one defined position, second electromagnet means including electric coil means operatively arranged for shifting the plugs into the other defined valve position in response to applying a control current to said electric coil means, said armature means of said individual valves being arranged in said valve housing means for tilting about a respective tilting axis into two defined tilting positions corresponding to said defined valve positions, said first magnet means comprising permanent magnet means arranged for tilting said armature means into one of said defined positions, said electromagnet means comprising a single electromagnet arranged for tilting both said armature means into the other of said defined position, and wherein the magnetic flux (F') of said first magnet means jointly encompasses both armature means (7') of the individual valves (V1', V2'), and wherein said valve housing means comprises two bore holes (25) for holding said first and second armature means, said bore holes having axes extending in parallel to each other with the holes arranged adjacent to each other, said armature means having a cross-sectional dimension smaller than the respective hole to provide a play (d) between the armature and the bore hole for permitting said tilting of said armature means in the respective hole, and wherein said permanent magnet means are shaped to fit into respective spaces bounded by said adjacent holes in said valve housing means, said permanent magnets being arranged opposite each other and having cyclically magnetized surfaces resting against the housing means next to said bore holes.

4,543,992

FLUID COUPLING ASSEMBLY

William B. Palmer, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 23, 1983, Ser. No. 564,946

Int. Cl.⁴ F16L *29/00*; F16K *31/05*

U.S. Cl. 137—614 **4 Claims**

1. A fluid coupling assembly for use in fluid transfer between a pair of fluid flow conduits, comprising:

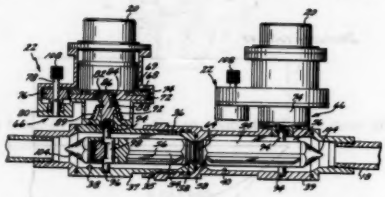
a pair of valve units for mounting respectively onto the flow conduits and each including a flow path for flow communication with the respective one of the flow conduits, said valve units having matingly engageable outboard ends;

a pair of valve members carried respectively within the flow paths of said valve units and respectively movable between closed positions preventing fluid flow through said valve units and open positions permitting fluid flow through said valve units;

a pair of drive motors respectively associated with said valve units; and

a pair of drive linkages coupled respectively between said drive motors and said valve members for moving said valve members between the closed and open positions in response to operation of said drive motors;

each of said drive linkages including manual override means for disconnecting the associated one of said valve members from the associated one of said drive motors and for permitting manual displacement of said associated valve member between the closed and open positions, each of



said drive linkages comprising a crankshaft rotatably supported by the associated one of said valve units and including an offset cam portion extending into a drive opening formed in the associated one of said valve members, and means coupled between said crankshaft and the associated one of said drive motors for rotating said crankshaft in response to drive motor operation, said coupling means comprising a drive gear rotatably driven by said associated drive motor, a driven gear for rotatably driving said crankshaft, an idler gear for transmitting rotary motion from said drive gear to said driven gear upon drive motor operation, means for movably supporting said idler gear for movement between a first position meshed with said drive and driven gears and a second position meshed with said driven gear and out of engagement with said drive gear, means for biasing said idler gear toward said first position, and manually accessible means for manually rotating said idler gear when said idler gear is in said second position.

4,543,993

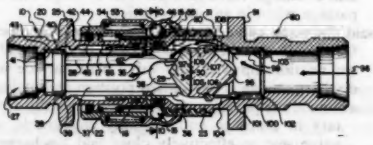
POSITIVE LOCKING CONNECTOR

John H. Calvin, 178 Santa Elena La., Santa Barbara, Calif. 93108, and Jack Y. Wakasa, 4025 Michael Ave., Los Angeles, Calif. 90066

Filed Apr. 4, 1983, Ser. No. 481,672

Int. Cl.⁴ F16L *29/00*

U.S. Cl. 137—614.03 **22 Claims**



22. A connector for holding a female coupling half and a male coupling half together comprising:

threaded means on the male and female coupling halves for moving the male coupling half axially into the female

coupling half upon rotation of the coupling halves relative to each other;

an actuator sleeve on the outside of the female coupling half; and

indexing means between the actuator ring and the female coupling half for locking the actuator sleeve to the rest of the female coupling half when the female coupling half and the male coupling half are not fully threaded together and for allowing the actuator sleeve to freewheel with respect to the rest of the female coupling half when the female coupling half and the male coupling half are fully threaded together.

4,543,994

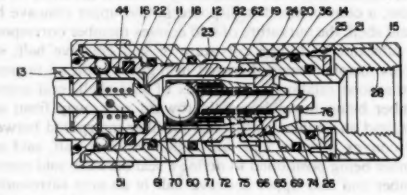
RIGID MOUNT COUPLER

Lyle R. Johnson, Minneapolis, and Eugene H. Herzan, Minnetonka, both of Minn., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 20, 1982, Ser. No. 450,890

Int. Cl.[4] F16L *37/00*

U.S. Cl. 137—614.04 **3 Claims**



1. A rigid mount coupler, comprising

a female member having

a housing and

a body member within said housing supported for axial movement relative to said housing between an inner and outer position, said body member having an axially inner end and an axially outer end,

a nipple received in said body member at said axially outer end, said nipple having a nipple valve and seat therein and spring bias means resiliently urging said nipple valve to a normally closed position, said nipple being engageable with said body member for moving said body member therewith solely with axial movement to said inner position and to said outer position,

locking means on said body member holding said nipple at said inner position and releasing said nipple at said outer position,

a valve seat in said body member,

a coupler valve,

means resiliently supporting said coupler valve in said body member for axial movement toward and away from said valve seat, said coupler valve being engageable by said nipple valve, said support means having a spring providing a force substantially the same as the force of said nipple valve spring bias means to balance both said valves at open positions relative to said respective valve seats,

flow check means resiliently supported in said body member and engageable with said coupler valve for resisting movement of said coupler valve to a more open position than said balanced open position, thereby to also resist movement of said nipple valve toward said nipple valve seat,

first seal means between said body member and said housing forming an inner chamber within said body,

second and third seal means between said body and said housing forming an outer chamber between said body and said housing,

a port in said body providing fluid communication between said inner and outer chambers, said chambers varying in volume as said body is moved relative to said housing and being dimensioned so that changes in volume of said inner and outer chambers are substantially equal and opposite, so that fluid displaced from one said chamber may be accommodated in the other said chamber, by way of said port, and

detent means between said body and said housing for releasably securing said body member in said outer and inner positions, thereby to assure respectively that said nipple is properly engaged in said body member and to resist initial outward movement of said body member, said detent means comprising an expandable ring and annular groove arrangement between said housing and said body members,

said coupler valve resilient support means comprising a support mounted in said body member for movement therewith, a bore in said support for receiving said coupler valve for axial movement, a counterbore in said support, and a tubular retainer received in said counterbore for axial movement, said spring being in said bore urging said retainer against said coupler valve and toward said coupler valve seat,

said flow check means comprising a pin received for axially slidable movement in a second counterbore in said support, a second spring urging said pin outwardly into engagement with said coupler valve and a stop for preventing outward movement of said pin at a predetermined location.

4,543,995

PIPE COUPLING HAVING LINE PRESSURE ACTUATED THREADED SEGMENTS

Erwin Weh, and Wolfgang Weh, both of Siemensstrasse 5, D-7918 Illertissen, Fed. Rep. of Germany

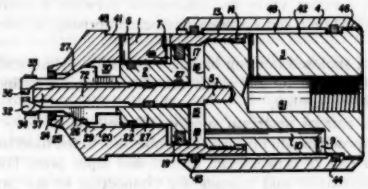
PCT No. PCT/DE83/00217, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 20, 1984, PCT Pub. No. WO84/02566, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 23, 1983, Ser. No. 643,616

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247784

Int. Cl.[4] F16L *37/28*

U.S. Cl. 137—614.06 **11 Claims**



1. A plug coupling for providing a pressure-sealed connection between a pressure conduit and a pressure medium actuated device provided with a thread connection means, a cylindrical housing, which is connected to said pressure conduit, being sealingly designed at its end face facing the thread connection means, and a fastening member which is adapted to be axially displaced relative to the housing having, at its end facing the thread connection means, clamping jaws which are provided with a thread and which are adapted to be brought into engagement with the thread connection means, and said clamping jaws being adapted to be radially adjusted via an inclined surface arrangement in the case of axial displacement of the fastening member, characterized in that the fastening member (**2**, **102**) is designed as a piston (**21**, **47**) guided in a stepped axial bore (**18**, **20**; **118**, **120**) of the housing (**1**), that the piston (**21**, **47**) is adapted to have applied thereto pressure in both axial directions by means of the pressure medium via a plurality of pressure paths (**7** to **10**), that the pressure conduit is adapted to be connected to the pressure medium actuated

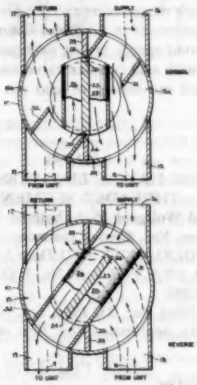
device via pressure paths (6, 8), that on the outer circumferential surface (41, 42; 141, 142) of the housing (1) an axially displaceable sleeve (4) is provided, which is sealed with respect to said outer circumferential surface (41, 42) at its two axial ends and which leaves open therebetween an annular interspace (48), and that the pressure paths (6, 7, 9, 10) are arranged in such a way that, depending on the position of the sleeve (4), they communicate with the pressure conduit (51) or with the ambient air.

4,543,996

FLUID FLOW DIVERTER VALVE WITH IMPROVED FLOW-THROUGH CONSTRUCTION

Walter J. Baron, Mequon, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Dec. 5, 1984, Ser. No. 678,353
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—625.43 **12 Claims**



1. A diverter valve for connection between a source of pressurized fluid and a process device, comprising, in combination:

(a) an enclosed housing having a generally cylindrical wall (10) closed by end walls (11, 13) to form a cylindrical valve chamber,

(b) a pair of upstream supply (16) and return (17) ports disposed in said housing for connection to the fluid source,

(c) a pair of downstream output and input ports (18, 19) disposed in said housing for connection to the process device,

(d) and means mounted in said housing for selectively connecting one of said upstream ports with one or the other of said downstream ports and for connecting the other of said upstream ports with one or the other of said downstream ports, said connecting means comprising:

(1) a valve element (20) rotatable between normal and reverse positions and including a pair of end heads (21, 22) joined by a longitudinally extending seatable element (23) having a pair of tapered edges (24),

(2) tubular fluid flow diverter means (28) mounted on said element (23) and extending transversely thereof, said tubular fluid flow diverter means (28) being disposed substantially radially inwardly from said cylindrical wall (10),

(3) and connector means (31, 32) fixedly secured to said cylindrical wall for forming a passage connecting said tubular fluid flow diverter means (28) to one of said upstream (16) and one of said downstream (19) ports when said valve element is in one of its said positions.

4,543,997

PRESSURE ACCUMULATOR

Masayuki Kishimoto, 1744 Takahashi, Ogasa-Cho, Ogasa-Gun, Japan

Filed Feb. 7, 1984, Ser. No. 577,850
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 **3 Claims**

1. An accumulator comprising a shell having an upper concave half including a apex coincident with the axis of said shell, a gas sealing opening formed substantially at said apex of said shell, a holder mounted in said shell, a bladder mounted on said holder, a convex member disposed in said upper concave half of said shell, the curvature of said convex member corresponding substantially to the curvature of said concave half, said convex member being disposed in registry with an in proximate spaced relation to said apex of said shell, said convex member being movable axially toward and away from said apex, and an annular elastic seal member interposed between said convex member and said upper concave half, said seal member being positioned to define a seal between said convex member and said upper concave half in an area surrounding said opening when said convex member is shifted toward said apex.

4,543,998

PROTECTOR CLAMP FOR WELL CONTROL LINES

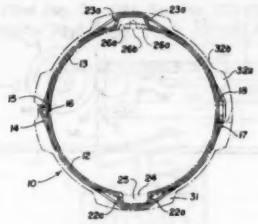
Clarence Thomerson, Corsicana, Tex., assignor to Regal International, Inc., Corsicana, Tex.

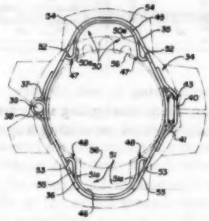
Filed Nov. 17, 1983, Ser. No. 552,806
Int. Cl.[4] F16L *3/22*
U.S. Cl. 138—110 **10 Claims**

1. A control line protector clamp having an elastic inner wall with at least one longitudinal slot therein to accommodate and secure control lines comprising: a pair of semicylindrical skeletal frame members coated with resilient material and connected together along one of their longitudinal edges and adapted to be releasably closed securely into a generally cylindrical configuration by fixing fastener means at their opposite longitudinal edges, at least one of said frame members comprising a generally semicylindrical main element and a brace, said main element being of lateral, parallel, rib-and-slot construction and a generally rectangular, three-walled, longitudinal channel formed along said main element with the open side of said channel facing inwardly of said frame member to encompass said slot and said brace being fixed with the ends and central area of the brace attached to the main element to form a triangular structure to resist collapse of said channel.

5. A control line protector clamp having an elastic inner wall with at least one longitudinal slot to accommodate and secure control lines comprising: a pair of semicylindrical skeletal frame members coated with resilient material, each formed of a main element and a brace fixed together, said main elements having a semicylindrical shape and being hinged together along one of their longitudinal edges and adapted to be closed into a generally cylindrical configuration by inserting a tapered drive pin member through a plurality of interleaved tapered slots formed at the opposite longitudinal edges of said main elements, said main elements being of lateral, parallel rib-and-slot construction, each brace having a generally rectangular, three-walled, longitudinal channel formed therein, the longitudinally extending edges of said brace being turned whereby the

opposite edges of said braces extend away from said slot, said brace being affixed to the internal wall of the main element with the open side of said channel facing inwardly of said frame member and encompassing said slot whereby said main





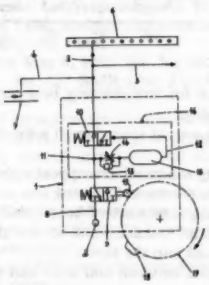
element extends across the outward angles between said channel side walls and the circumference line of said main elements and abuts against the longitudinally extending turned edges of said brace to form a triangular structure to resist collapse of said channel.

4,543,999

SEQUENTIAL CLEANING DEVICE FOR A LOOM

Albert H. Deborde, and Gilles Grandvallet, both of Bourgoin Jallieu, France, assignors to Saurer Diederichs, Bourgoin Jallieu, France

Filed Oct. 13, 1983, Ser. No. 541,668
Claims priority, application France, Oct. 26, 1982, 82 18361
Int. Cl.[4] D03D *49/00, 47/30*
U.S. Cl. 139—1 C **5 Claims**



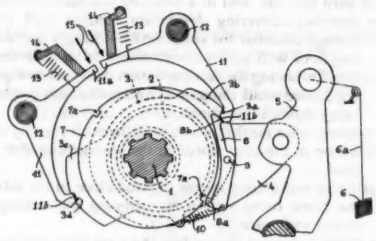
1. A sequential cleaning device operable by compressed air for a loom, the device comprising, upstream of a pneumatic utilization circuit leading to various points to be cleaned on the loom, a pneumatic control circuit connected to a compressed air inlet and comprising, on a main pneumatic line, a first distributor which is normally closed and whereof the opening is controlled at successive instants at the time of operation of the loom and a second distributor which is normally open, controlled pneumatically and supplied by a branch pneumatic line of the main pneumatic line and associated with which are pneumatic delay means, the first distributor being controlled mechanically and cyclically by a rotary member of the loom.

4,544,000

SYNCHRONIZED ROTATING DOBBY FOR WEAVING LOOMS

Pierre F. X. Bourgeaux, La Balme de Sillingy, France, assignor to S. A. des Etablissements Staubli (France), Fauerges, France

Filed Jan. 24, 1984, Ser. No. 573,280
Claims priority, application France, Feb. 7, 1983, 83 02271
Int. Cl.[4] D03C *1/00*
U.S. Cl. 139—66 R **2 Claims**



1. An improved rotating dobby for a reversible weaving loom including a shaft which rotates intermittently through 180° and including an actuating rod for each heddle frame and including a pattern reading mechanism, and the dobby being of the type having a drive disc associated with each actuating rod and fixed to rotate with the shaft and having diametrically opposed drive notches, and the dobby having a plate member journaled on the shaft and fixed to eccentric means operative to reciprocate the actuating rod when the plate member rotates, said plate member having an immobilizing notch on its outer periphery and having a pivot which supports pawl means including a first end having a finger which is spring urged to engage a drive notch of the drive disc to couple the plate member to the drive disc and including a heel portion disposed adjacent said immobilizing notch and displaceable to disengage the finger from a drive notch, and the dobby having paired levers supported on fixed pivots and having noses extending toward diametrically opposite sides of the plate member and the noses normally being spring urged to enter a notch in the plate member and immobilize the plate member and displace the heel portion of the pawl, and said reading mechanism being operative selectively to pivot the levers to move their noses away from said plate member, the improvement comprising:

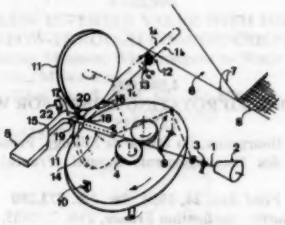
a second notch in the plate member which is disposed diametrically opposite said immobilizing notch and so located with respect to said pair levers that when the immobilizing notch is disposed at an angle of plate rotation to receive the nose of one of said levers, said second notch is disposed at an angle of plate rotation to receive the nose of the other of said levers.

4,544,001

WEFT YARN INTO THE SHED OF A WEAVING MACHINE

Albert Moessinger, Epalinges, Switzerland; Guy Gosciniak, Illfurth, and Joël Angebault, Riedisheim, both of France, assignors to Societe Alsacienne de Construction de Materiel Textile, Mulhause, France

Filed Dec. 14, 1983, Ser. No. 561,337
Claims priority, application France, Dec. 17, 1982, 82 21506
Int. Cl.[4] D03D *47/12*
U.S. Cl. 139—443 12 Claims



1. A device for the preparation and insertion of at least one weft yarn into the shed of a weaving machine, comprising:

a metering-delivering device for feeding weft yarn to a storage chamber for temporarily storing a predetermined length of weft yarn prior to insertion into the shed;

means for halting the feeding action of the metering-delivering device while the yarn stored in the storage chamber is being thrown into the shed;

rotating roller means for inserting the weft yarn by throwing a loop of the yarn stored in the storage chamber into the shed;

gripping and cutting means situated close to the selvedge of the fabric being woven for gripping and cutting the inserted weft yarn;

a guiding channel for guiding the weft yarn into and out of the storage chamber, said guiding channel comprising:

a first part extending from said storage chamber towards said rotating roller means and substantially in line with said rotating roller means, and

a second part extending laterally from an end of said first part closest to said rotating roller means and further extending generally in the direction of said metering-delivering device, said second part having a continuous longitudinal slot formed on a side thereof closest to a gripping portion of said rotating roller means.

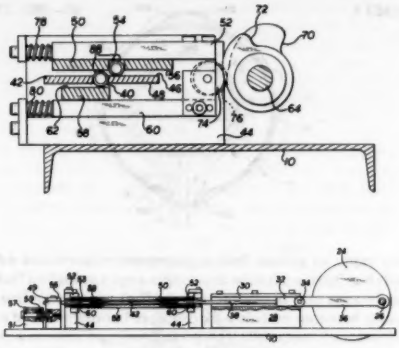
4,544,002

AUTOMATIC SPRING COMPRESSING MACHINE

David V. Aronson, 5955 Sibley Rd., Chelsea, Mich. 48118

Filed Apr. 16, 1984, Ser. No. 600,550
Int. Cl.[4] B21F *35/00*
U.S. Cl. 140—89 5 Claims

1. An automatic spring compressing machine comprising, in combination, a frame, an elongated spring compression chamber defined upon said frame having an upper entrance opening and a lower egress opening, an elongated axially movable plunger mounted on said frame within said chamber adapted to compress a spring therein, plunger operating means mounted upon said frame, a spring load plate mounted on said frame above said compression chamber movable between spring load and transfer positions, spring load plate operating means mounted upon said frame, said spring load plate having an elongated spring receiving slot defined therein aligning with said chamber upper entrance opening at said spring load position to permit a spring to drop from said slot into said chamber and a lower side extending over said chamber at said transfer position to confine a spring within said chamber during compression, a release plate mounted upon said frame below said compression chamber movable between spring retaining and spring release positions, release plate operating means mounted upon said frame, said release plate having an upper side aligning with said chamber egress opening at said spring retaining



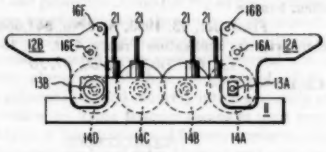
position to confine a spring in said chamber during compression and said release plate misaligning with said egress opening at said spring release position permitting a spring to drop from said chamber.

4,544,003

TERMINAL STRAIGHTENER FOR AN INTEGRATED CIRCUIT PACKAGE

Richard L. Bumann, Olivenhain, and Patrick G. Chipman, San Diego, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 2, 1984, Ser. No. 627,120
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—147 12 Claims



1. A mechanism for straightening bent terminals on an IC package, comprising:

a base having a pair of spaced apart arms pivotally coupled thereto;

said arms having rollers which support a plate and move said plate when said arms are pivoted;

said plate having a first set of holes which are tapered to accept said bent terminals and to straighten them when they are forced into the taper;

a plurality of pins between said arms that extend from said base and stop in a plane parallel to said plate;

said plate having a second set of holes through which said pins move when said arms are pivoted to push on said IC package; and

a plurality of intermeshed gears coupled to said base and said arms that synchronize the pivotal movement of said arms such that said package and plate move perpendicular to said pins and said terminals move straight out of said first set of holes.

4,544,004

FILLER UNIT FOR TOPPING UP A CONTAINER WITH LIQUID

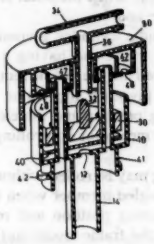
Johan C. Fitter, 48 Maluti Ave., Quellerina, Florida, Transvaal, and David J. Henderson, Krugersdorp, both of South Africa, assignors to Johan Christiaan Fitter, South Africa

Filed Jan. 24, 1984, Ser. No. 573,035

Claims priority, application South Africa, Jan. 26, 1983, 83/0502

Int. Cl.[4] B65B *3/06*

U.S. Cl. 141—31 9 Claims



1. A filler unit for use in dispensing a liquid into a container to top up the container to a predetermined, desired level, the unit including a vessel for containing the liquid to be dispensed, means for establishing a predetermined, substantially constant head of liquid in the vessel, at least one orifice in the bottom of the vessel, a baffle in the vessel spaced close to the bottom of the vessel to form a capillary passage to allow liquid to flow to at least one orifice by capillary action, and a downpipe extending downwards from the orifice below the vessel, the unit being intended for location in use above the container with the downpipe extending into the container such that in use the liquid is able to flow from the vessel to the container under gravity along the flowpath defined by the capillary passage, the orifice and the downpipe until such time as the liquid level in the container has risen to the desired level with the lower end of the downpipe below the level thereof to trap air in the downpipe and below the orifice and a condition of pressure equilibrium is attained in the flowpath which causes the flow from the vessel to the container to cease automatically.

4,544,005

CAN DETECTION AND SWITCH MECHANISM FOR CAN FILLING APPARATUS

Konrad E. Meissner, Lafayette, and John W. Colombo, Castro Valley, both of Calif., assignors to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed May 6, 1983, Ser. No. 492,408

Int. Cl.[4] B65B *3/04, 57/04*

U.S. Cl. 141—94 5 Claims

1. In a filling apparatus for containers having a rotatable multiple station turret, a plurality of filling valves mounted circumferentially around said turret and rotatable therewith, means for moving a container into and out of engagement with each filling valve, and a control means for manipulating each of the filling valves in a repeating sequence through closed, vacuum, fill and vent positions, the improvement wherein said control means comprises:

a plurality of cam followers, one cam follower connected to each filling valve;

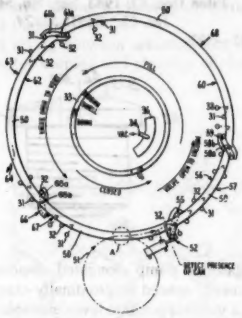
a stationary camming means extending at least partially around said turret and being engagable by said cam followers;

a switching cam engagable by said cam followers for initiating a sequence for operating each filling valve but only if a container is present for filling;

actuating means for moving said switching cam between positions of "fill" and "no fill;"

first sensing means for detecting the presence of a container beneath each filler valve that approaches the switching cam;

second sensing means for detecting the presence of a filler valve approaching the switching cam; and



circuit means responsive to said first and second sensing means for operating said actuating means.

4,544,006

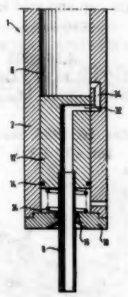
APPARATUS FOR FILLING DISPENSING CONTAINERS WITH A LIQUID OR PASTY PRODUCT

Hans-Herbert Trenner, Hamburg, Fed. Rep. of Germany, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,681

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—105 8 Claims



1. An apparatus for filling dispensing containers with a liquid or pasty product having a filling station with a hollow filling tube having an upper and a lower end which filling tube is insertable into a dispensing container by movement of the filling tube with respect to the dispensing container, and a prechamber containing a filling product connected to the upper end of the filling tube, characterized in that a telescopic tube (8) having an upper end and a lower end is provided which is coaxially reciprocatable with respect to the filling tube (2), the upper end (10) of the telescopic tube (8) communicating with the prechamber (6) and being fixed to a piston (12) which is seaingly guided with respect to filling tube (2), and the lower end (16) of the telescopic tube is movable through an opening (20) in a bottom plate (18) closing the lower end of the filling tube and that a restoring tube (24) between the piston (12) and the bottom plate (18) is provided, whose spring tension is less than the sum of filling pressure of the filling product and the frictional forces of telescopic tube (8).

4,544,007

VEHICLE GASOLINE TANK CAP FOR GASOLINE PUMP FLOW CONTROL

Samuel R. Abraham, 3521 N.W. 54, #291, Oklahoma City, Okla. 73112

Filed Dec. 12, 1983, Ser. No. 560,618
Int. Cl.[4] B65D *51/24*
U.S. Cl. 141—392 1 Claim

1. In a gasoline pump elongated dispensing valve nozzle having a laterally spaced longitudinally extending lever guard and having a variable position lever movable toward and away from the lever guard for dispensing and interrupting gasoline flow from the nozzle in combination with a vehicle gasoline tank filler neck gas cap having circular outer and inner end portions and having a diametric or axial dimension freely received between said lever and the lever guard when the lever is moved toward gasoline dispensing position, the improvement comprising:

resilient material means having a surface providing a relatively high coefficient of sliding friction, when compared with metallic surfaces, including at least one strip extending transversely across the outer end portion of said gas cap; and,

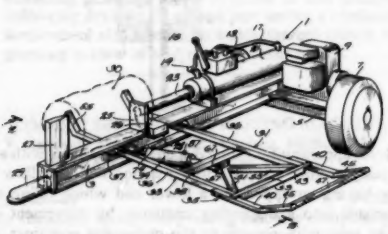
a cushion axially overlying the inward end portion of of said gas cap for maintaining said lever in gasoline dispensing position by increasing the coefficent of sliding friction between said gas cap and said lever and the lever guard.

4,544,008

LOG LIFTER FOR LOG SPLITTER

Donald N. Reini, W322 S1743 Moraine View Dr., Delafield, Wis. 53018

Filed Mar. 16, 1984, Ser. No. 590,455
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 A 5 Claims



1. In combination with a log splitting machine having an elongated frame, a log splitting station defined by a cutting wedge mounted to the frame and by a first hydraulic splitting cylinder mounted to the frame and having a reciprocating piston adapted to push a log against the cutting wedge, a log lifter for feeding logs to the splitting station without manually lifting them from the ground, comprising:

(a) frame means extending laterally from and pivotally connected at a first end to the log splitting frame for rotation about an axis substantially parallel to the splitting cylinder longitudinal axis between a first ground-contacting position and a second elevated position, the frame means comprising:

i. an inner frame pivotally connected to the log splitting machine frame;

ii. an outer frame pivotally connected to the inner frame for selective folding onto the inner frame for compact transportation, the outer frame being formed with an angled member;

iii. a block secured to the inner frame; and

iv. at least one structural member secured to the outer frame and adapted to abut the inner frame block to maintain a substantially planar relationship between the inner and outer frames as the inner frame rotates with respect to the log splitting frame when the outer frame is unfolded from the inner frame; and

(b) a second hydraulic cylinder pivotally connected to the splitting machine frame and having a reciprocating piston pivotally connected to the block secured to the log lifter inner frame for pivoting the frame means between the ground-contacting position and the elevated position; and

(c) hydraulic circuit means for controlling the first and second cylinders,

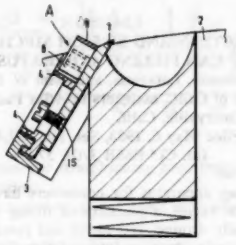
so that an unsplit log may be rolled without manual lifting onto the outer frame angled member when the frame means is in the ground-contacting position and rolled to the splitting station by raising the frame means to the elevated position.

4,544,009

SCRATCHER ELEMENT FOR A WOOD-CUTTING TOOL

Harro Kröcher, Bad Kreuznach, Fed. Rep. of Germany, assignor to Hombak Maschinenfabrik GmbH & Co. KG, Bad Kreuznach, Fed. Rep. of Germany

Filed Jan. 23, 1984, Ser. No. 573,033
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 8301544[U]
Int. Cl.[4] B27G *13/04*
U.S. Cl. 144—230 6 Claims



1. A scratcher element for a wood-cutting tool having a cutter spindle and a support holding a cutter and including a support strip which receives the scratcher element, the scratching element comprising a substantially rectangular scratcher plate having opposite end faces and two opposite scratcher edges, and two attachment projecting outwardly of said end faces, said plate having a central plane, said edges extending through said central plane, said attachments being disposed centrally between said opposite edges, said attachments being mirror-inverted in respect to said central plane, said supporting strip being formed with at least one recess receiving said attachments in a form-locking fashion, each of said attachments having a shape of a segment of a circular disc.

4,544,010

TIRE AND ANTISKID NET FOR VEHICLE TIRES

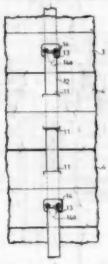
Günter Friedewald, Warstein, Fed. Rep. of Germany, assignor to Siepmann-Werke GmbH & Co. KG, Warstein, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,444

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234028

Int. Cl.⁴ B60C *27/00*

U.S. Cl. 152—231 **13 Claims**



1. A tire and antiskid chain for vehicle tires, particularly for tires of heavy earth moving machines, comprising a plurality of vertical members to be arranged substantially normal to a tire surface; a plurality of connecting rings of a limited length and arranged to extend substantially parallel to the tire surface and to engage said vertical members, said connecting rings being composed of a spring steel hardened to a required wear-resistance, each of said connecting rings having a ring part and two end legs abutting against one another, said end legs of each of said connecting rings having sides which abut against one another and are flat; and a plurality of closure sleeves each arranged to hold together the end legs of a respective one of said connecting rings, each of said closure sleeves being in a fitted on position on a respective one of said connecting rings and overlapping on the latter said two end and also overlapping said ring apart in its end portiosn adjoining said end legs.

13. A tire and antiskid chain for vehicle tires, particularly of tires of heavy earth moving machines, comprising a plurality of vertical members to be arranged substantially normal to a tire surface; a plurality of connecting rings of a limited length and arranged to extend substantially parallel to the tire surface and to engage said vertical members, each of said connecting rings having two end legs abutting against one another, said legs of each of said connecting ring extend in a circumferential direction and mirror-symmetrically engage in one another in an engagement region wherein one of said legs has an arresting projection which engages in an arresting recess of the other said leg; a plurality of closure sleeves each arranged to hold together the end legs of a respective one of said connecting rings, each of said closure sleeves being fitted over said end legs in said engagement region and having a curvature corresponding to the curvature of said connecting rings in said region; and means for securing the position of each of said closure sleeves, said securing means including an annular bead provided on one end and a clamping ring provided on the other end of each of said connecting rings.

4,544,011

PLEAT SCREEN

Mamoru Sawamura, Gifu, Japan, assignor to Dowa Seishi Co., Ltd., Japan

Filed Jul. 1, 1983, Ser. No. 510,412

Int. Cl.⁴ E06B *9/262*; A47H *5/032*

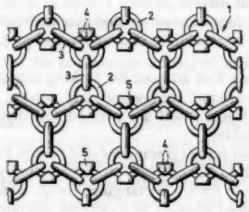
U.S. Cl. 160—84 R **4 Claims**

1. A pleat screen having a front side and a back side comprising:

a screen having a plurality of pleats vertically foldable and unfoldable, each of said pleats having an upper portion and a lower portion and each having slits defined therein defining in said screen at least one vertically aligned row of slits;

at least one tape, extending vertically along said screen between the upper and lower ends thereof and extending through said vertically aligned row of slits defined therein, said tape having a plurality of vertically aligned slots defined therein;

holding means acting between selected ones of said pleats and said tape for keeping said plurality of pleats vertically



spaced at substantially equal distances, wherein said holding means comprises a plurality of holders attached vertically immovably to said tape in abutment against said lower backs of the selected pleats for supporting, from below, said pleats to thereby prevent the latter from being lowered under their own weight, said holders having locking tongues, each locking tongue being inserted into one of said slots such that said holders are retained on the tape respectively at said slots.

4,544,012

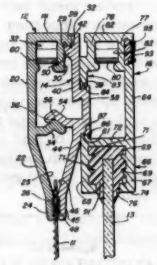
SUNSCREEN THERMAL AND FRAME ASSEMBLY

Fred Woodward, 720 E. Dunlap, Phoenix, Ariz. 85020

Filed Jan. 12, 1984, Ser. No. 569,787

Int. Cl.⁴ E06B *3/32*

U.S. Cl. 160—90 **8 Claims**



1. A snap together sunscreen assembly for installation in overlying relation to an existing window comprising in combination,

a screen frame base having an upper end terminating in a top rail and a lower end terminating in a lower nose end having an interior surface and including first gripping means associated therewith,

said screen frame base having first locking means formed thereon,

said first locking means comprising an undercut recess formed along said top rail of said screen frame base,

a screen frame insert having an upper end terminating in a top edge and a lower end terminating in a lowered nose

end having an interior surface and including second gripping means associated therewith and an exterior surface thereof,

said screen frame insert having mating locking means formed thereon for mating engagement with said first locking means of said screen frame base,

said mating locking means comprising a mating locking rib formed along said upper end of said screen frame insert,

said locking rib of said screen frame insert being engageable within the confines of said undercut recess formed along said top rail of said screen frame base,

a lock receiving foot carried on said screen frame base approximately intermediate said upper end and said lower nose end thereof,

a locking foot carried on said screen frame insert approximately intermediate said upper end and lower nose end thereof,

said locking foot adapted for locking engagement with said lock receiving foot when said screen frame base and screen frame insert are pressed together in face to face relationship,

each of said screen frame base and screen frame insert being adapted to be cut into correspondingly equal sections thereby to form a rectangular frame assembly sized to fit any desired window in overlying relation,

and a sunscreen panel sized for containment with said rectangular frame and held in place by said first and second gripping means when said screen frame base and screen frame insert sections are lockingly engaged thereby to form said rectangular frame.

4,544,013

METHOD OF RECLAIMING SAND USED IN EVAPORATIVE CASTING PROCESS

Dolores C. Kearney, Inkster; Peter Giza, Livonia, and Bruno Matz, Milford, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 7, 1983, Ser. No. 549,131

Int. Cl.[4] B22C *9/02*

U.S. Cl. 164—5 **7 Claims**

1. A method of reclaiming sand used in casting a metal having a liquidus temperature below 2000° F., the casting method using a vaporizable pattern set within a mold constituted of unbonded sand, comprising:

(a) blowing, after a lapse of time of about 5–10 minutes after the pouring of molten metal into said mold to form a casting, a combustion supporting gas into and through said mold to fluidize at least the region of said sand adjacent to the casting in which the temperature ranges from 1400°–800° F. and thereby to utilize the radiant heat of said molten metal to combust volatilized byproducts of said pattern in said region of sand about the casting; and

(b) continuing the blowing of said combustion supporting gas to continue combustion, additional volatilization of byproducts, and driving of said gas and products of combustion out of said mold.

4,544,014

MACHINE FOR CONTINUOUSLY CASTING BATTERY GRIDS

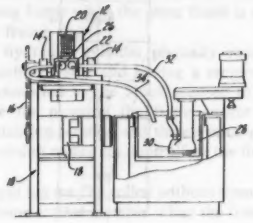
Jack E. McLane; Raymond L. Schenk; Robert R. Rader, and John W. Wirtz, all of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

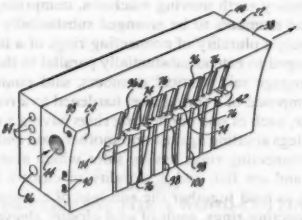
Division of Ser. No. 517,668, Jul. 27, 1983, Pat. No. 4,509,581, which is a division of Ser. No. 380,056, May 20, 1982, Pat. No. 4,415,016. This application Nov. 8, 1984, Ser. No. 669,383

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—429 **9 Claims**

1. In a machine for continuously casting battery grids, the machine including a drum adapted to be rotated in one direction and having on its outer peripheral surface a cavity which defines the pattern of the battery grid, said grid pattern comprising two sets of intersecting grooves, said grooves defining pads therebetween which form the outer peripheral surface of the drum and which define the open spaces between the wires of the cast battery grid, said machine including a shoe having an arcuate surface in mating engagement with said pads around an arcuate segment of the drum, said shoe having an orifice slot therein which is axially co-extensive with said cavity and which is open at a portion of said arcuate surface that is intermediate the circumferentially opposite ends of the shoe, said shoe having an inlet and an outlet communicating with axially spaced portions of the orifice slot, said machine also including





means for directing molten lead at superatmospheric pressure to said inlet in an amount in excess of that required to progressively fill the grid cavity as it rotates past the opening in the orifice slot so that the excess is discharged through said outlet, that improvement which comprises the shoe being formed of a relatively high heat conducting metal and an insert is embedded in said arcuate surface of the shoe, said insert being formed of a metal having low heat conductivity relative to the shoe and forming at least the downstream side of the orifice slot relative to the direction of rotation of the drum.

4,544,015

CONTINUOUS CASTING PLANT

Werner Scheurecker, Linz; Karl Holzer, Stadt Haag; Kurt Engel, Leonding, and Hermann Schubert, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 5, 1983, Ser. No. 455,813

Claims priority, application Austria, Jan. 12, 1982, 80/82

Int. Cl.[4] B22D *11/12*

U.S. Cl. 164—442 **9 Claims**

1. In a continuous casting plant, in particular an arcuate continuous casting plant for steel strands, of the type including,

a through-type mould,

supporting elements following said mould and including strand guideways having a longitudinal axis,

a stationary cooling chamber surrounding said supporting elements, and

a stationary structure to which said supporting elements are connected, at least one of said supporting elements being movable relative to said mould and to another of said supporting elements in a direction transverse to said longitudinal axis of said strand guideways, the improvement comprising;

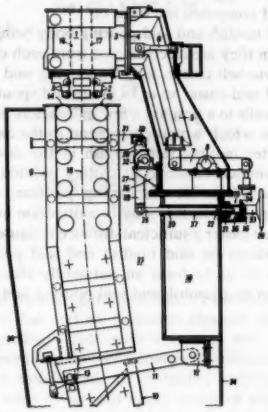
at least one means for adjusting the position of said at least

one supporting element from outside of said cooling chamber, said adjusting means including

a variably movable adjustment member mounted exteriorly of said cooling chamber,

actuating means coupled to said adjustment member and extending into said cooling chamber, and

means coupling said actuating means to said at least one



supporting element for displacing said supporting element within said cooling chamber transversely to said longitudinal axis by amounts selectively determined by the extent of movement of said adjustment member,

whereby said at least one supporting element may be aligned relative to said mould and said another said supporting element along said longitudinal axis by controlled movement of said adjustment member.

4,544,016

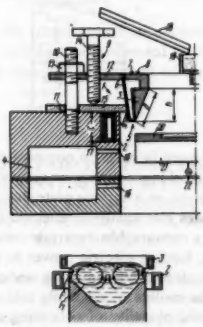
CONTINUOUS CASTING PROCESS AND APPARATUS

Zinovy N. Yetselev, prospekt Metallurgov, 73, kv. 30, and Genrich I. Martynov, ulitsa Partizanskaya, 206, kv. 43, both of Kuibyshev, U.S.S.R.

Filed Apr. 21, 1983, Ser. No. 487,139

Int. Cl.⁴ B22D *27/02*

U.S. Cl. 164—467 **2 Claims**



1. A continuous casting process comprising the following steps:

continuous feeding of a molten metal into a mould containing an electromagnetic inductor and a nonmagnetic stabilizing coil arranged coaxially with said inductor in direct proximity to its butt end;

supplying an electric current to said inductor of said mould;

supplying said stabilizing coil of said mould with an electric current with its phase lagging behind that of the current supplied to the inductor with the phase angle between them ranging from 95° to 165°, the amplitude of current in the stabilizing coil being 0.1 to 0.4 times the amplitude of current in the inductor;

submitting the molten metal to the action of an electromagnetic field created in the inductor of said mould and to the action of an electromagnetic field of the stabilizing coil of said mould so as to form a column of molten metal; and

cooling said column of molten metal with the resultant formation of an ingot.

2. Apparatus for the continuous casting of metal, comprising:

a mould formed by an electromagnetic inductor and a nonmagnetic stabilizing coil arranged coaxially with said inductor in direct proximity to its butt end, said stabilizing coil having in cross section the form of a triangle with its apex oriented inside said mould, the height of said triangle in cross section of said stabilizing coil and the greater side of said triangle being in the ratio ranging from 0.7 to 0.96, the triangle extending vertically in a plane parallel to the axis of said inductor and having its apex displaced relative to the butt end of said inductor in a manner projecting inside said inductor by a distance of 0.1 to 0.5 times the height of said inductor;

a ring-shaped cooler for cooling metal, arranged coaxially with said inductor;

an additional cooler for cooling said stabilizing coil, arranged coaxially therewith; and

said stabilizing coil made from a material whose resistivity ρ is determined from the following relationship:

$$\rho = \frac{1}{K} \cdot f \cdot 10^{-9}\ Oh \cdot m,$$

where f is the frequency of current in said inductor, K = 3 or 4.

4,544,017

USE OF A HYDRAULIC SQUEEZE FILM TO LUBRICATE THE STRAND IN CONTINUOUS CASTING

Anthony R. Lansdown, Swansea, England, assignor to The University College of Swansea, Swansea, England

PCT No. PCT/GB83/00079, § 371 Date Nov. 18, 1983, § 102(e) Date Nov. 18, 1983, PCT Pub. No. WO83/03214, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 17, 1983, Ser. No. 557,282

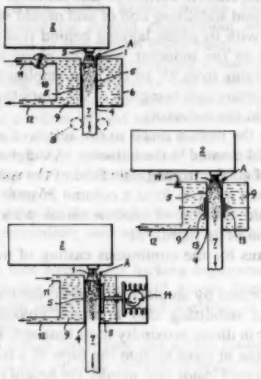
Claims priority, application United Kingdom, Mar. 18, 1982, 8207988

Int. Cl.⁴ B22D *11/04*

U.S. Cl. 164—472 **9 Claims**

1. A method of continuously casting a strand, comprising the steps of: providing a cooled mould having a wall defining a passage having one end and another end; feeding molten material into said one end in a direction toward said other end; lubricating said passage by interposing film of lubricant between said mould wall and said molten material, said lubricant film having a thickness; withdrawing an at least surface-hardened strand from said other end of said passage; and subjecting at least one region of said wall of said mould to oscillations transverse to the direction of movement of said molten material, said oscillations having an amplitude less than said lubricant film thickness, and also having a frequency that is less than

that which will promote cavitation in said lubricant film, said amplitude and said frequency of said oscillations generating a



pressure increase in said lubricant by way of a squeeze film phenomenon.

4,544,018

FEEDING DEVICE FOR INTRODUCING MOLTEN STEEL INTO TWIN-BELT CASTERS AND MODE OF OPERATION OF SUCH A FEED DEVICE

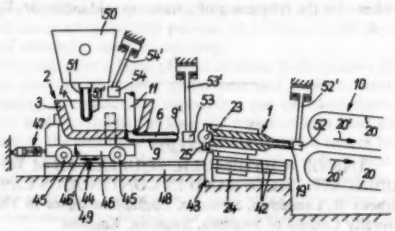
Dieter Figge; Hans Siemer, both of Essen; Gerd Artz, Ratingen, and Clemens Philipp, Meerbusch, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 592,457

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311090

Int. Cl.⁴ B22D *11/06, 11/10*

U.S. Cl. 164—481 **14 Claims**



14. A method of operating a feeding device for the introduction of molten steel into a twin-belt caster employing mold walls that are moved exclusively in the casting direction wherein said feeding device comprises:

a tundish having a flow channel; a first carriage for supporting the tundish so that it is adjustable in height and moveable toward and away from the twin-belt caster; a tubular closed pouring body having a spout whose end is shaped such that a sealing gap is produced between the end of the pouring body and the mold walls of the twin-belt caster when the end of the spout is inserted between the mold walls; a separate second carriage disposed between the first carriage and the twin-belt caster and likewise moveable toward and away from the twin-belt caster; means for mounting the pouring body on the second carriage so that the pouring body is rotatable about a horizontal pivot axis oriented such that the spout is adjustable in height with respect to the caster, and so that the pouring body is laterably adjustable in a direction transverse to its longitudinal extent; and means for connecting the flow channel of the tundish to the pouring body to permit molten steel to flow from the tundish through the pouring body, with the connecting means comprising a ball joint having a ball socket and a ball pivot each forming a connecting surface and with one of these connecting surfaces being disposed on the pouring body and the other of these connecting surfaces being disposed on the tundish; and wherein said method comprises the steps of:

with said tundish and said pouring body being in a position wherein they are disconnected from each other and from said twin-belt caster, initially moving said pouring body toward said caster so as to insert said spout between said mold walls to a position a few millimeters further than the position which would correspond to the casting position; thereafter moving said tundish in the direction toward said twin-belt caster to its casting position and arresting said tundish in its said casting position; and thereafter moving said pouring body in a direction away from said twin-belt caster a sufficient distance to cause said connecting surfaces on said tundish and said pouring body to engage so as to form an outwardly closed connection between said tundish and said pouring body.

4,544,019

METHOD AND APPARATUS FOR MANUFACTURING COMPOSITE STEEL INGOT

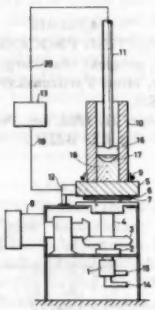
Hideyo Kodama; Yasuo Kondo, and Kimihiko Akahori, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,703

Claims priority, application Japan, May 14, 1982, 57-79859

Int. Cl.⁴ B22D *27/02*

U.S. Cl. 164—496 **23 Claims**



1. A method of manufacturing a composite steel ingot comprising locating a steel ingot having an empty space positioned concentrically therein on a surface plate, having a plurality of collecting electrodes electrically connected thereto in spaced relation, inserting a consumable electrode into the empty space of said steel ingot, feeding electric power to said comsumable electrode to effect electroslag remelting under a slag bath, and then solidifying the molten metal while taking out an electric current through said plurality of collecting electrodes which are electrically connected to said steel ingot placed on the surface plate, wherein a flow path of the electric current passing from said consumable electrode to said collecting electrodes is moved in the circumferential direction of said steel ingot during said electroslag remelting.

4,544,020

METHOD OF REGULATING THE HEAT TRANSFER COEFFICIENT OF A HEAT EXCHANGER AND IMPROVED HEAT EXCHANGER FOR PRACTICING SAID METHOD

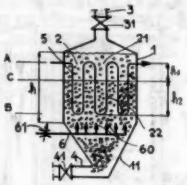
Gérard Chrysostome, le Creusot, and Daniel Borgnat, Montchanin, both of France, assignors to Creusot-Loire, Paris, France

Filed May 23, 1983, Ser. No. 497,483

Claims priority, application France, May 26, 1982, 82 09188

Int. Cl.⁴ F28C *3/16*

U.S. Cl. 165—1 **4 Claims**



1. Method of regulating the heat transfer coefficient between a granular material and an exchange element of a heat exchanger comprising a tank with a vertical axis in which is arranged a descending flow of a charge of granular material in the form of a mobile bed, an elongated exchange element extending between lower and upper levels of said tank, and means for injecting beneath said charge and with adjustable flow a fluidization gas distributed homogeneously and forming an ascending current traversing said charge from bottom to top, said granular material being cooled from top to bottom by heat exchange with said exchange element, and said fluidization gas being heated by contact with said material, an increase in the temperature of said gas determining a continuous increase in the speed of its ascending flow, said method comprising the steps of

(a) regulating the injection flow of said gas beneath said charge to a value such that the initial flow speed of said gas at the base of said exchanger is less than a critical speed at which said material is fluidized, said cricital speed being attained due to acceleration resulting from heating of said gas at an adjustable level which is located between said upper and lower levels of said exchange element, the latter thus covering two superposed zones of said charge of a height variable inversely to one another, namely a lower dense zone with a low exchange coefficient and an upper, fluidized zone with a high exchange coefficient; and

(b) regulating the quantity of heat exchanged between said charge and said exchange element by varying said fluidization level through adjustment of the flow of injected gas.

4,544,021

METHOD AND APPARATUS FOR EXTRACTING HEAT FROM A NATURAL WATER SOURCE

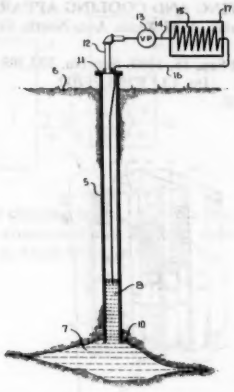
George M. Barrett, R.R. #5, Galt, Ontario, Canada (N1R 5S6)

Filed May 9, 1978, Ser. No. 904,453

Int. Cl.⁴ F28D *1/04*

U.S. Cl. 165—45 **4 Claims**

1. A heating system comprising a well casing having a lower end and an upper end portion, said lower end being coupled to a natural water source, a vacuum pump having an intake and a discharge, first conduit means connecting said well casing upper end portion to said vacuum pump in sealed relation, a condenser coil, and second conduit means connecting said vacuum pump discharge to said condenser coil for passage therethrough, said well casing having a head of water therein, and wherein said well casing has a height above the normal level of water in said well casing in excess of vacuum pull of



said vacuum pump wherein a space remains in said well casing for the forming of water vapor in said casing.

4,544,022

DEVICE FOR THE THERMAL TREATMENT OF PRODUCTS, ESPECIALLY FOOD AND BEVERAGES

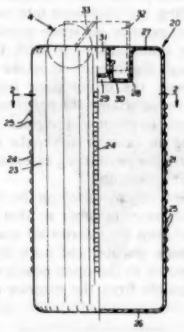
Zeljko Tomac, Moritzstr. 3, 6200 Wiesbaden, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,856

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 8216051[U]; Jun. 3, 1982, 8216053[U]; Mar. 12, 1983, 8307207[U]

Int. Cl.⁴ F24H *3/00*

U.S. Cl. 165—47 **16 Claims**



1. A device for the thermal treatment of products, especially food and beverages, comprising a container for holding a thermal medium, said container defining a thermal element having walls which are at least partially formed as heat conductive walls, said heat conductive walls being formed in sections having a shape complementry to the product to be treated for maximum heat exchange when one of said sections and said product are brought into mutual surface contact, said container being formed with at least one filling and discharge opening provided with an opening and closing element for said thermal medium, the sections of said thermal element being rigid, with at least one section being formed as a concave segment of a cylinder, said concave segment having a frontal

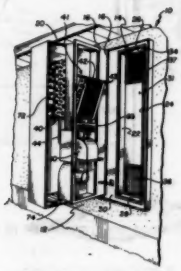
edge thereof formed with a recess for receiving radially extending can rims.

4,544,023

AIR HEATING AND COOLING APPARATUS

Walter J. Marciniak, 4657 Xenia Ave. North, Crystal, Minn. 55422

Filed Sep. 16, 1983, Ser. No. 533,208
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—48 R **11 Claims**



1. A heat exchange apparatus mountable within an opening in a wall structure of a building for transferring heat between the interior of the building and the environment, said wall structure having an interior wall panel and an exterior wall panel, the interior wall panel having an interior air intake and an interior air discharge means communicating with the interior of the building, the apparatus comprising:

a housing defining an enclosure and having a frame, a pivotal mounting means, a panel member and an exterior cover door, the frame member being attachable to the wall structure, the panel member having an interior surface and an exterior surface and being pivotally mounted by the pivotal mounting means to the frame and being pivotal between a closed position and an open position, the panel member dividing the enclosure into an interior air space portion and an exterior air space portion, the interior air space portion communicating with the interior of the building through the interior air intake and the interior air discharge means, the cover door being detachably attached to the frame so that the panel member is accessible and is permitted to pivot to the open position, the cover door including an exterior air intake and an exterior air discharge means for permitting exterior air to flow within the exterior air space; and

heat transfer selectively mounted on the exterior and interior surfaces of the panel member so that heat is selectively transferred between the interior air space portion and the exterior air space portion and such that when the panel member is pivoted to the open position, the heat transfer means is accessible from the exterior of the building for maintenance.

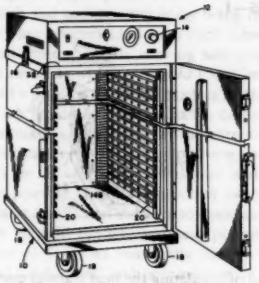
4,544,024

INSULATED CABINET WITH INTERCHANGEABLE HEAT TRANSFER UNIT

George T. Baggott, Cleveland, Ohio, assignor to Crescent Metal Products Inc., Cleveland, Ohio

Filed Sep. 16, 1983, Ser. No. 532,688
Int. Cl.[4] F25B *13/00, 29/00*
U.S. Cl. 165—48 R **4 Claims**

1. An insulated cabinet assembly comprising an insulated cabinet and an interchangeable heat transfer unit, said cabinet including an opening in the top thereof, said unit including inlet means for receiving air from the interior of said cabinet and outlet duct means for directing air from said heat transfer unit to said cabinet, said cabinet including tunnel means disposed vertically in said cabinet for receiving air from said duct means and distributing the air uniformly within said cabinet, said duct means including two parallel walls and two oppositely inclined walls, said tunnel means including walls defining a passage with a rectangular cross-section, said duct means terminating at its lower end with an extension adapted to fit within said rectangular passage of said tunnel means, said tunnel including two columns of louvers extending the entire



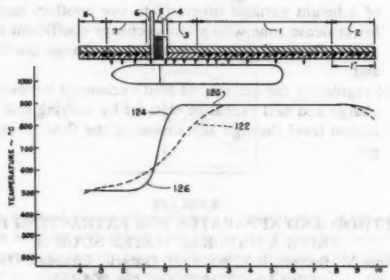
length of said tunnel means, and baffle means for deflecting air flowing from said tunnel means through the louvers, said baffle means including a flat plate and perforated edge portions, said louvers being formed in a front facing wall of said tunnel means and said baffle means being parallel to and in front of said louvers, said baffle including a solid portion between said perforations of a widthwise extent at least as large as that of the two columns of louvers.

4,544,025

HIGH GRADIENT DIRECTIONAL SOLIDIFICATION FURNACE

Billy R. Aldrich, Huntsville, and William D. Whitt, Toney, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 17, 1984, Ser. No. 571,614
Int. Cl.[4] F27D *11/02*
U.S. Cl. 165—65 **20 Claims**



1. A directional solidification furnace comprising:

an elongated tube adapted to receive and have translated therethrough a material-containing ampule;

a plurality of annular elements disposed around said tube along its length and in heat transfer relation therewith, individual elements of said plurality having a heating, cooling or passive character;

said elements being selected and placed so as to provide within said tube a hot region adjacent one end, a heated,

but cooler, region adjacent the other end and an intermediate region therebetween having a steep axial thermal gradient;

said elements including a passive element disposed around said intermediate region, a booster heater element between said passive element and said hot region and a cooling element between said passive element and said cooler region;

housing means and means for actuating said elements.

4,544,026

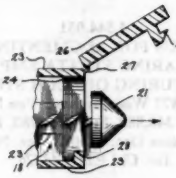
HEAT EXCHANGER TUBE CLEANING ELEMENT CAPTURING DEVICE WITH HINGED RETAINER

Walter J. Baron, Mequon, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Dec. 5, 1984, Ser. No. 678,351

Int. Cl.⁴ F28G *1/12*

U.S. Cl. 165—95 **4 Claims**



1. For use in a heat exchanger or the like having a housing containing a plurality of fluid flow tubes,

a device comprising:

(a) an elongated molded plastic basket having an inner end for connection with a said tube and an open outer end, and with said basket, when so connected, forming means to capture a shuttleable tube cleaning element propelled through a tube by fluid,

(b) and cleaning element retainer means integral with and disposed adjacent the said open outer end of said basket for preventing outward escape of a cleaning element through said open outer end of said basket or for permitting full unobstructed access through said open outer end to the basket interior,

(c) said basket retainer means comprising:

(1) a closure,

(2) a living hinge connecting said closure to the end portion of said basket so that said closure is pivotally swingable between an open position permitting said unobstructed access and a closed cleaning element retaining position,

(3) and means to lock said closure in closed position.

4,544,027

SLUICE FOR COLLECTING CLEANING BODIES

Gerhard Goldberg, Düsseldorf, and Alois Lange, Ratingen, both of Fed. Rep. of Germany, assignors to Taprogge Gesellschaft mbH, Düsseldorf, Fed. Rep. of Germany

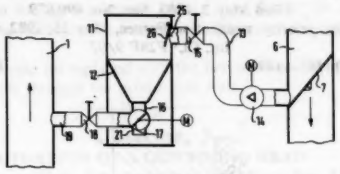
Filed Jul. 25, 1983, Ser. No. 516,797

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227708

Int. Cl.⁴ F28G *1/00*

U.S. Cl. 165—95 **9 Claims**

1. A sluice for collecting cleaning bodies in the form of sponge rubber balls which are guided in the circulation of cooling water through the pipes of a heat exchanger having inlet and outlet connections, in particular a generating plant condenser, comprising a return line passing through the sluice, the return line including an inlet line having a pump and an outlet line having a shut-off valve, a cylindrical housing including a sieve body and a shutting flap connected downstream of the sieve body, the housing being connected to the outlet connection of the heat exchanger through the inlet line and being connected to the inlet connection of the heat exchanger through the outlet line, and a flap trap disposed in the return



line for the cleaning bodies inside the sluice housing between the outlet connection and the inlet connection of the heat exchanger to block the inlet line.

4,544,028

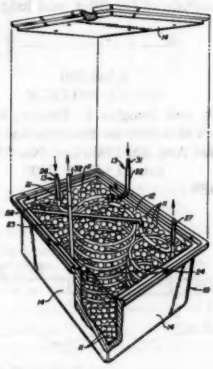
HEAT ACCUMULATOR

David W. Chase, San Jose, Calif., assignor to C. Mitchell Bedford, Monterey, Calif.

Filed Apr. 20, 1983, Ser. No. 486,655

Int. Cl.⁴ F28D *13/00*; F24H *7/00*

U.S. Cl. 165—104.14 **6 Claims**



1. A heat storage apparatus comprising:

a vessel having insulating walls and containing a heat-transfer fluid bath;

a plurality of mobile heat-storage elements containing a phase-change material, each said heat-storage element having substantially zero buoyancy in said fluid bath, said plurality of heat-storage elements being disposed within said fluid bath in sufficiently loose configuration to allow said heat-storage elements to migrate about said vessel; and

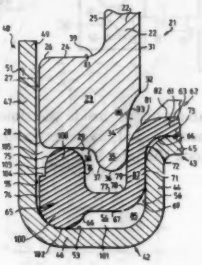
a charging conduit and a discharge conduit for conducting fluid through said heat-transfer fluid bath, said conduits being spaced apart from one another within said fluid bath, whereby said heat-storage elements are free to migrate between hotter and cooler regions of said heat-transfer fluid bath for the transfer of heat therewith.

4,544,029

SEALED JOINT BETWEEN A BASIN AND A COVER PLATE

Patrick Cadars, Montigny, France, assignor to Valeo, Paris, France

Filed May 2, 1983, Ser. No. 490,879
Claims priority, application France, May 26, 1982, 82 09195
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—149 **14 Claims**



1. A sealed joint between a basin and a plate, such as may be used in the construction of a heat exchanger tank, said basin having a rim with an outwardly directed flange, and said plate having a rim including a U-shaped channel to receive said flange together with a gasket, said gasket comprising at least a fillet suitable for being elastically deformed by being compressed between said flange and said channel to fill the space therebetween, the improvement wherein the portion of the fillet facing the flange is narrower than the portion of the fillet facing the channel by virtue of at least one set-back in the fillet between said portions thereof and said set-back is in the form of a ledge in the surface of the fillet, said ledge facing said basin flange.

4,544,030

SHELL NOZZLE

Mikel S. Crook, and Douglas E. Decker, both of La Crosse, Wis., assignors to American Standard Inc., New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,210
Int. Cl.[4] F28F *9/00*
U.S. Cl. 165—159 **3 Claims**

1. An outlet nozzle for minimizing the pressure drop in the fluid flowing out of a pressurized fluid handling device having a continuously curved wall portion, comprising:

pipe means penetrating said continuously curved wall portion of said fluid handling device and extending therethrough into the interior of said device, said pipe means being in sealing engagement with said continuously curved wall portion;

a bell-shaped orifice body having a mouth end, the end of said orifice body opposite said mouth end being attached to said pipe means within the interior of fluid handling device so that fluid flowing into said mouth end of said orifice body is gathered and directed through said body into said pipe means; and

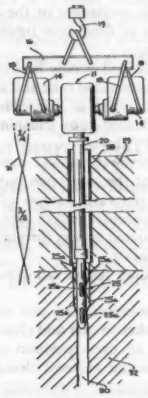
mounting plate means disposed about the periphery of said mouth end of said orifice body and extending therefrom into contact with said continuously curved wall portion of said fluid handling device, for eliminating flow behind and directing fluid flow into said bell-shaped orifice body, said mounting plate means having a rectangular flat portion, a first end plate and a second end plate, said first and said second end plates each having a curved edge and being attached to said rectangular portion at opposite edges of said rectangular portion, said rectangular portion being attached to the periphery of said mouth end of said orifice body and extending therefrom so that the opposite edges of said rectangular portion other than said opposite edges to which said first and said second end plates are attached extend to the curved sidewall of said fluid handling device, said end plates being angled from said rectangular portion so that said curved edges of said end plates extend to said curved sidewall along the entire length of said curved edges.

4,544,031

SONIC APPARATUS FOR AUGMENTING FLUID FLOW FROM FLUID-BEARING STRATA EMPLOYING SONIC FRACTURING OF SUCH STRATA

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Division of Ser. No. 348,880, Feb. 16, 1982, Pat. No. 4,471,838.
This application Dec. 7, 1983, Ser. No. 544,102
Int. Cl.[4] E21B *43/26*
U.S. Cl. 166—177 **5 Claims**



1. A system for fracturing an earthen formation surrounding a well to engender an increased flow of fluid therefrom comprising:

an elastic stem member,

a wedging tool attached to one end of said stem member, said wedging tool having wedging contact means in the form of a rigid solid tapering body, which progressively changes in its lateral dimension along the longitudinal extent thereof,

means for suspending said stem member in said well with said contact means in vertically biased wedging engagement with a portion of said formation forming the walls of said well,

means for generating sonic vibratory energy and

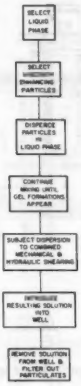
means for coupling said energy to said stem member to effect longitudinal elastic vibration of said stem member and to said wedging tool and thence to said formation in a nonisotropic manner, thereby to effect the fracturing thereof.

4,544,032

METHOD AND APPARATUS FOR PRODUCTION OF PERFECT WELL TREATMENT FLUID SOLUTIONS

John B. Echols, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Apr. 2, 1984, Ser. No. 596,021
Int. Cl.[4] E21B *21/00, 43/04, 43/40*
U.S. Cl. 166—267 **15 Claims**


SELECT LIQUID PHASE
SELECT VISCOSITY ENHANCING PARTICLES
DISPERSE PARTICLES IN LIQUID PHASE
CONTINUE MIXING UNTIL GEL FORMATIONS APPEAR
SUBJECT DISPERSION TO COMBINED MECHANICAL & HYDRAULIC SHEARING
INTRODUCE RESULTING SOLUTION INTO WELL
REMOVE SOLUTION FROM WELL & FILTER OUT PARTICULATES

1. The method of treating a subterranean well with an increased viscosity liquid solution and reducing clogging of formations or gravel packs, with such solution, comprising the steps of:

(1) mixing dry viscosity-enhancing particles into a liquid phase to produce a dispersion of the dry particles in the liquid phase;

(2) mixing the dispersion until at least hydration of the viscosity-enhancing particles is initiated, thereby forming an interface between the particles and the liquid phase;

(3) subjecting the dispersion to concurrent mechanical and hydraulic shearing forces sufficient to break down the interface and perfecting the dissolution of the viscosity-enhancing particles into the liquid phase; and

(4) introducing the resultant perfect solution into a subterranean well for treatment of at least a portion thereof.

8. The method of preparing a well treatment fluid comprising a perfect solution of viscosity-enhancing particles in a liquid phase, comprising the steps of:

(1) dispersing the viscosity-enhancing particles in the liquid phase;

(2) mixing the dispersion until at least hydration of the viscosity-enhancing particles is initiated, thereby forming an interface between the particles and the liquid phase; and

(3) subjecting the dispersion to concurrent mechanical and hydraulic shearing forces sufficient to break down the interface and completing the dissolution of the viscosity-enhancing particles in the liquid phase.

4,544,033

OIL RECOVERY PROCESS

Toshiyuki Ukigai, Chiba; Masaaki Hagiwara, Ichikawa, and Junichi Yamada, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,972
Claims priority, application Japan, Apr. 4, 1983, 58-57784
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **5 Claims**

1. A process for recovering oil from an oil-bearing subterranean reservoir penetrated by at least one injection well and at least one production well which comprises the steps of:

(1) injecting into the oil-bearing subterranean reservoir through the injection well a first injecting fluid consisting essentially of (a) 1% to 30% by weight of an internal olefin sulfonate having 10 to 26 carbon atoms and a disulfonate content of 20% by weight or less, (b) 0.1% to 20% by weight of a cosurfactant, and (c) a brine;

(2) injecting, as a second injecting fluid, an aqueous polymer solution having a viscosity higher than that of the first injecting fluid into the oil-bearing subterranean reservoir; and

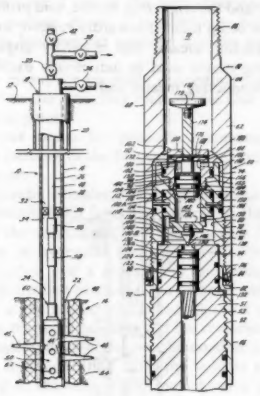
(3) recovering oil replaced with the first and second injecting fluids through the production well.

4,544,034

ACTUATION OF A GUN FIRING HEAD

Flint R. George, Katy, Tex., assignor to GEO Vann, Inc., Houston, Tex.

Filed Mar. 31, 1983, Ser. No. 481,074
Int. Cl.[4] E21B *43/116*
U.S. Cl. 166—297 **18 Claims**



1. Method of firing a perforating gun which is suspended within a well on the end of a pipe string, comprising the steps of:

(1) communicating a fluid flow path from the surface to a firing head adjacent the perforating gun;

(2) effecting a predetermined pressure through the fluid flow path to the firing head;

(3) closing a passageway through a movable wall reciprocally mounted in a chamber within the firing head in response to the predetermined pressure of step (2);

(4) opening a valve in the fluid flow path for fluid communication with one side of the movable wall in the chamber in response to the predetermined pressure of step (2);

(5) effecting the predetermined pressure on the one side of the movable wall to cause the movable wall to move; and

(6) using the movement of the movable wall of step (5) for detonating the charges of the perforating gun.

4,544,035

APPARATUS AND METHOD FOR USE IN DETONATING A PIPE-CONVEYED PERFORATING GUN

Charles V. Voss, 3800 Plateau Pl., Casper, Wyo. 82604

Filed Feb. 14, 1984, Ser. No. 580,069
Int. Cl.[4] E21B *43/118.5*
U.S. Cl. 166—299 **12 Claims**

1. An apparatus for detonating an explosive using a triggering device housed in a carrier located in a bore hole, comprising:

a first coupling member, said first coupling member being

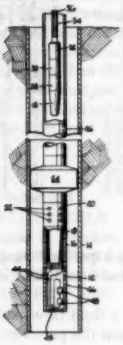
made of a non-ferromagnetic material, said first coupling member being free of shielding that protects against high frequency electrical fields;

secondary conducting means being coiled about portions of said first coupling member;

first electrical connecting means associated with said first coupling member, said first electrical connecting means adapted to be connected to the carrier containing the explosive, said first electrical connecting means electrically connecting said secondary conducting means to the triggering device and the explosive located in the carrier;

a second coupling member, said second coupling member being made of a non-ferromagnetic material, said second coupling member being free of shielding that protects against high frequency electrical fields;

primary conducting means being coiled about portions of said second coupling member, both said first coupling member and said second coupling member being apart from, but removably joined to, the carrier housing the explosive and the triggering device, said primary conducting means being located inwardly relative to said secondary conducting means, said inwardly disposed primary conducting means used in inductively exciting said secondary conducting means; and



second electrical connecting means associated with said second coupling member, said second electrical connecting means adapted to be connected to means used in moving said second coupling member, said second electrical connecting means electrically connecting said primary conducting means and a source of electrical energy, said second electrical connecting means extending from the source of power down the bore hole to said primary conducting means;

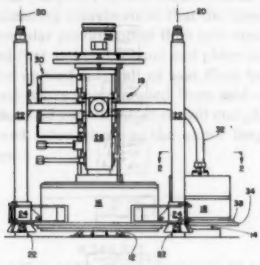
said first coupling member and said second coupling member being separately positioned in the bore hole and being matingly engageable, said primary conducting means and said secondary conducting means providing a path for electrical energy from the source of electrical energy for detonating the explosive wherein electrical energy is supplied from the source of electrical energy to said primary conducting means using said second electrical connecting means, said primary conducting means inductively coupling electrical energy to said secondary conducting means for detonating the explosive using the triggering device after and first coupling member and said second coupling member are matingly engaged.

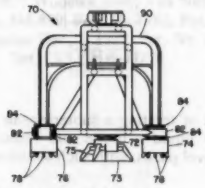
4,544,036

VERTICAL FLOWLINE CONNECTOR

Kenneth C. Saliger, DeSoto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 17, 1984, Ser. No. 581,449
Int. Cl.[4] E21B *43/013*
U.S. Cl. 166—341 **16 Claims**





1. Apparatus for establishing a flowline connection from a subsea facility to a flowline extending therefrom, comprising:

a. a subsea facility including at least two vertically positioned, upwardly facing male mandrel connectors;

b. a flowline extending from said subsea facility onto the adjacent subsea bottom, said flowline terminating at said subsea facility in one of said upwardly facing male mandrel connectors;

c. a connector assembly designed to be lowered onto the subsea facility, including at least two vertically positioned, downwardly facing male connectors designed to be lowered onto the at least two upwardly facing male mandrel connectors, with at least one downwardly facing female connector being mounted to the connector assemble by a free floating mounting, said free floating mounting including a bushing loosely mounted to said female connector to allow for slight misalignments of the female connectors on the connector assembly relative to the male connectors on the subsea facility as the connector assembly is lowered onto the subsea facility, said connector assembly including a flowline, also providing flexibility for said free floating mounting, joining said at least two male and corresponding female connectors to establish a flowline communication from said flowline, through said connector assembly, to the further subsea facility.

4,544,037

INITIATING PRODUCTION OF METHANE FROM WET COAL BEDS

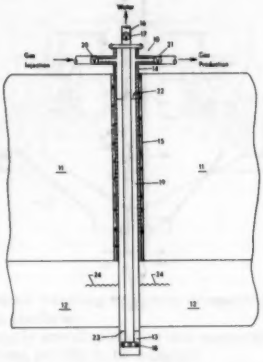
Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Golden, Colo.

Filed Feb. 21, 1984, Ser. No. 581,733
Int. Cl.[4] E21B *43/25*
U.S. Cl. 166—369 **7 Claims**

1. A method of producing methane from a gassy underground coal seam that also is an aquifer, wherein the aquifer

contains hydraulic head that impedes free flow of methane from the fracture system within the coal and free flow of the methane contained within the pore system of the coal, comprising the steps of:

drilling a well from the surface of the earth into the underground coal, the well being cased with casing cemented in place, and the well having means to permit injection of fluids into the underground coal, means to withdraw fluids from the underground coal, and means to terminate



injection of fluids into and withdrawal of fluids from the underground coal,

injecting a gas into the well and into the coal under sufficient pressure to displace water from the coal within the vicinity of the wellbore,

terminating injection of the gas, then

opening the well to the flow of fluids and producing first the injected gas, followed by producing a mixture of the injected gas and methane, and then by producing methane.

4,544,038

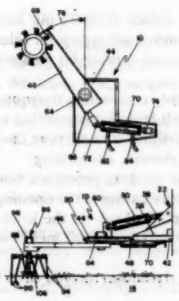
ROTARY TILLER APPARATUS AND PIVOTAL SUPPORT STRUCTURE THEREFOR

Robert F. Schonert, Star Rte. #9, Bismarck, N. Dak. 58501

Filed Jan. 17, 1983, Ser. No. 458,343

Int. Cl.[4] A01B *65/02*

U.S. Cl. 172—78 **6 Claims**



1. A rotary tiller apparatus mountable on a vehicle having front and rear wheels and a hydraulic power supply for supplying hydraulic power to the apparatus, the apparatus comprising:

an earth working tool;

a first bracket adapted for side mounting to the vehicle at a location intermediate the front and rear wheels, the bracket including a flat mounting plate forming a generally horizontally oriented plane;

a first support member having first and second ends and pivotally mounted to the mounting plate of the first bracket at the first end along a substantially horizontal pivot axis for pivotal movement between a substantially horizontal work position and an upwardly-inclined retracted position at a first pivot point, the first support member comprised of a flat plate having top and bottom surfaces forming a generally horizontally oriented plane;

a second bracket mounted to and extending upwardly from the top surface of the first support member;

a second support member having a first and second end and pivotally attached along a substantially vertical axis to the first support member at a second pivot point positioned between the first and second ends of the second support member, the first end of the second support member being mounted underneath the bottom surface of first support member, and the earth working tool being mounted proximate the second end of the second support member for pivotal motion about a substantially horizontal plane when the first support member is in the horizontal work position;

first pivot means for pivotally connecting the first support member to the mounting plate of the first bracket at the first pivot point;

second pivot means for pivotally connecting the second support member to the first support member at the second pivot point;

a first hydraulic cylinder, first conduit means for transporting hydraulic fluid from the vehicle to the cylinder and back to the vehicle and first valve means for controlling the flow of hydraulic fluid, the first hydraulic cylinder having a first and a second end and being pivotally attached to the first bracket at the first end and to the second bracket at the second end so that the first member pivots between the work position and the retracted position; and

a second hydraulic cylinder, second conduit means for transporting hydraulic fluid from the vehicle to the cylinder and back to the vehicle and second valve means for controlling the flow of hydraulic fluid independently from the first valve means, the second hydraulic cylinder being mounted underneath the bottom surface of the first support member and having a first and a second end, the second hydraulic cylinder being pivotally attached at the first end to the first end of the second support member and being pivotally attached at the second end to the first support member for driving the earthworking tool about the substantially horizontal plane in a sweep motion between an extended position and a retracted position adjacent to the vehicle.

4,544,039

TORQUE TRANSDUCING SYSTEMS FOR IMPACT TOOLS AND IMPACT TOOLS INCORPORATING SUCH SYSTEMS

David O. Crane, Leicestershire, United Kingdom, assignor to Crane Electronics, Limited, Nuneaton, United Kingdom

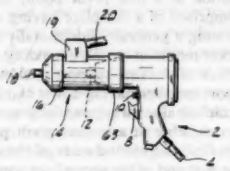
Filed Apr. 1, 1983, Ser. No. 481,579

Int. Cl.[4] B25B *23/145*

U.S. Cl. 173—12 **22 Claims**

1. Torque transducing system including a housing, bearings in the housing, a rotatable shaft journalled in the bearings, said shaft having a torque receiving input end and an output end supplying torque for a workpiece, a torque transducing gauge on the shaft intermediate the input and the output end for providing a first signal responsive to torque, means on the rotatable shaft for modulating the first signal to a second signal, a plurality of brush assemblies mounted on the housing and a corresponding plurality of sliprings on the rotatable shaft, one pair of said sliprings forming a means for supplying current to the torque transducing gauge and one slipring forming a means

for transmitting the second signal, the modulating means including an amplifier to permit transmission of the second output signal to its brush assembly with a proportionately low signal loss to provide an output indicative of torque in which each brush assembly includes a pair of brush arms pivotably mounted at one end with respect to the housing, resilient means biassing the arms towards each other, resilient, electri-



cally conductive strips extending toward and alongside the slipring, and brushes secured to the strips to engage the slipring at substantially diametrically opposite positions, signal loss being reduced by maintaining the brushes in contact with the slipring by resilient movement of the arms as a whole with respect to the housing and by that of the brushes with respect to the brush arms by resilient deformation of the strips.

4,544,040

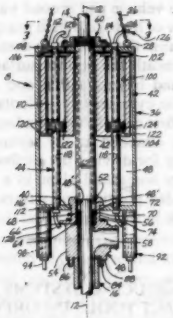
APPARATUS FOR DRIVING AN ELONGATED PIECE INTO AND/OR OUT OF THE GROUND

Gerald T. Sweeney, Puyallup, Wash., assignor to Tigre Tierra, Inc., Puyallup, Wash.

Continuation of Ser. No. 520,219, Aug. 5, 1983, abandoned, which is a continuation of Ser. No. 266,948, May 26, 1981, abandoned. This application Jun. 29, 1984, Ser. No. 626,471

Int. Cl.[4] B25D *9/18*

U.S. Cl. 173—91 **30 Claims**



1. In drilling apparatus wherein means are connectible with an elongated tubular piece to form a tubular anvil on one end thereof for the transmission of impact forces to the piece, a drill string is inserted through the anvil into the one end of the piece, and the piece is driven into the ground or the like by impacting the anvil while the drill string is operated in the piece, the improvement comprising a support, a tubular anvil-impacting ram reciprocably mounted on the support and having a pair of spaced parallel grooves in one face thereof which are mutually offset longitudinally the reciprocable path of the ram to form collateral mutually longitudinally offset lands on the one face thereof, and means for reciprocating the ram including valve means having fluid connections with points in the paths of the respective grooves in the one face of the ram and the lands corresponding thereto.

4,544,041

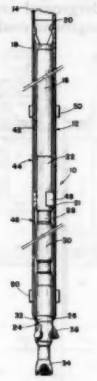
WELL CASING INSERTING AND WELL BORE DRILLING METHOD AND MEANS

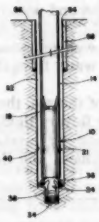
Roger E. Rinaldi, 8435 S. Quebec, Tulsa, Okla. 74137

Filed Oct. 25, 1983, Ser. No. 545,222

Int. Cl.[4] E21B *7/20*

U.S. Cl. 175—57 **9 Claims**





1. An apparatus for simultaneously inserting a well bore casing and drilling a well bore, comprising:

a control sub means operably connected to the lowermost end of the well bore casing;

motor means suspended within the control sub;

a drilling bit means operably connected with the motor means;

releasable locking means cooperating between the motor means and the control sub means for selective releasing of the motor means and drilling bit means through the well casing; and

power means operably connecting the motor means with the surface of the well bore for controlled operation thereof.

7. A method of drilling a well bore and simultaneously inserting well casing therein, comprising:

initially opening the earth to provide a bore therein;

positioning a well bore casing in the opening in the earth, the casing having a control sub on the lower end thereof;

positioning a motor driven drill bit means within the control sub;

releasably locking the motor driven drill bit means to the control sub;

selectably releasing the motor driven drill bit means from the control sub for retrieval of the motor driven drill bit means through the well bore casing;

actuating the drill bit means for deepening the bore and simultaneously moving the housing and casing downwardly in the bore until the desired well bore competion depth is achieved.

4,544,042

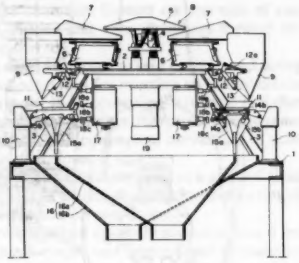
HOPPER DOOR ACTUATING APPARATUS FOR AN AUTOMATIC WEIGHING APPARATUS

Yoshiharu Mikami, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Continuation-in-part of Ser. No. 549,762, Nov. 8, 1983. This application Apr. 19, 1984, Ser. No. 601,930

Int. Cl.⁴ G01G *19/22, 13/16, 13/34*

U.S. Cl. 177—25 **6 Claims**



1. An automatic weighing apparatus comprising:

a supporting platform;

an article supply unit disposed on said supporting platform, for supplying articles to be weighed;

a plurality of hoppers disposed adjacent to said article supply unit, for receiving articles from said article supply unit, each said weighing hopper having at least one gate;

a plurality of weighing machines disposed on said support platform and respectively associated with said hoppers, for weighing articles contained in said hoppers;

a source drive mechanism disposed at the center of and below said supporting platform; and

a plurality of hopper gate opening devices disposed on the bottom of said supporting platform inwardly of and respectfully associated with said hoppers, each hopper gate opening device including a drive shaft rotated constantly by said drive mechanism, a push rod for opening the gate of the hopper associated with each hopper gate opening device opposes; and transmission means, for transmitting the rotational motion of said drive shaft to said push rod, said transmission means having a follower roller connected to the push rod, a cam provided with a guide portion, said guide portion engaging said follower roller, a clutch portion for engaging said cam with said rotary shaft, and a brake portion for stopping the rotation of said cam.

4,544,043

ELECTRONIC SCALE WITH COUNTERBALANCE

James M. Stuart, Malvern, Pa., assignor to Malvern Scale Company, Malvern, Pa.

Filed Feb. 28, 1984, Ser. No. 584,412

Int. Cl.⁴ G01G *1/00, 3/14, 1/28*

U.S. Cl. 177—194 **7 Claims**

1. A flexure base scale comprising:

an outer frame structure including opposed, elongate side walls;

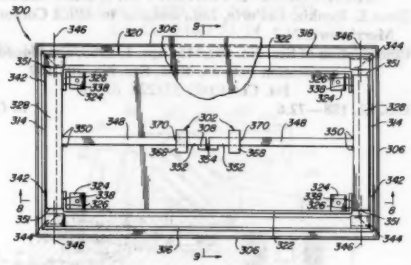
a platform means overlying the frame structure and adapted to move downwardly upon receipt of some material thereon;

a pair of spaced-apart, generally parallel elongate torsion members, each of said torsion members being adjacent a respective elongate side wall of the frame structure;

each torsion member having a first portion including an outer surface facing the elongated side wall to which it is adjacent, a second portion including an inner surface facing the inner surface of the other elongate member, and a rotational axis between said first and second portions;

coupling means for coupling the platform means to the first portion of each torsion member for applying a force on the first portion in the direction in which the platform means is adapted to move upon receipt of said material for imposing a torque on the torsion members in opposite rotational directions;

a lever arm coupled to the second portion of each of said torsion members, each lever arm extending laterally from its respective second portion in a direction toward the other lever arm for imposing a torque on each torsion



member in a rotational direction opposed to the rotational direction of torque imposed on each torsion member by the coupling of the platform means to the first portion of each torsion member; and

force sensing means coupled to the lever arms for measuring the force applied to the lever arms by sensing the movement of said lever arms in a direction opposite to the direction of movement of the platform means upon receipt of said material on said platform means.

4,544,044

MOTORCYCLE DRIVE WHEEL SUSPENSION SYSTEM

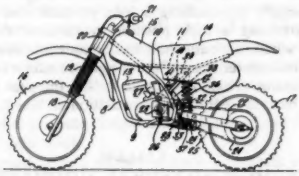
Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation-in-part of Ser. No. 513,311, Jul. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 368,220, Apr. 14, 1982, Pat. No. 4,408,674, which is a continuation-in-part of Ser. No. 351,630, Feb. 23, 1982, which is a continuation-in-part of Ser. No. 269,322, Jun. 1, 1981, abandoned. This application Oct. 21, 1983, Ser. No. 544,091

The portion of the term of this patent subsequent to Nov. 10, 2000, has been disclaimed.

Int. Cl.⁴ B62K *25/20*

U.S. Cl. 180—227 **20 Claims**



1. In a motorcycle having a frame, a drive wheel, a motor, and wheel drive mechanism including a motor sprocket, a wheel sprocket, and a drive chain connecting the sprockets, a drive wheel suspension system comprising first and second levers pivotally mounted on first axes spaced one above the other in a first generally upright plane in the region of the axis of the motor sprocket, first linkage pivotally interconnecting said levers on second axes in a second generally upright plane between the motor sprocket and the forward edge of the drive wheel, a swing arm for the drive wheel extended forwardly of

the wheel and pivotally connected with said first linkage on a transverse axis between the motor sprocket and the front of the wheel, one of said levers having an extension beyond the first linkage, a generally upright swing arm link pivotally interconnecting the swing arm and said extension, and means connected with the wheel suspension system for resisting drive wheel deflection.

4,544,045

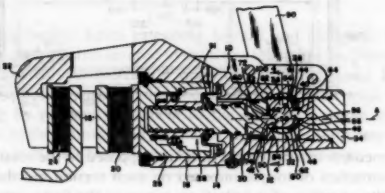
MECHANICAL ACTUATOR FOR A DISC BRAKE

Dean E. Runkle, LaPorte, Ind., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 481,515, Apr. 1, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 704,139

Int. Cl.[4] F16D *55/224, 65/16*

U.S. Cl. 188—72.6 **10 Claims**



1. A dual toggle mechanical actuator for a disc brake within a caliper assembly cooperates with at least one friction pad to engage the latter with a rotor, the caliper assembly including a housing with a bore receiving a piston assembly which is movable in the bore to engage the friction pad with a rotor, and a mechanical actuator disposed in the bore for moving the piston assembly, characterized in that the mechanical actuator comprises an easily reversible, dual toggle mechanical actuator having a cam shaft extending into the bore, a reaction toggle cooperating with the cam shaft and the housing and an output toggle disposed between the piston assembly and the cam shaft for imparting movement to the piston assembly in response to rotation of the cam shaft, each of the toggles having a pair of pivot points about which the toggles move, the reaction toggle and output toggle cooperating with grooves of said cam shaft to define asymmetric interfaces therebetween so that angular travel of said toggles is different when said cam shaft is rotated and said cam shaft moves in the direction of said piston assembly, and an end wall enclosing said bore, the reaction toggle pivoting relative to said cam shaft and relative to said end wall during a first stage of braking when said cam shaft is rotated, and said reaction toggle moving with said cam shaft to pivot relative to said end wall during a second stage of braking, the output toggle approaching a lock position and the reaction toggle attaining a lock position relative to the respective grooves when said cam shaft has completed rotation wherein longitudinal center lines of the toggles remain a distance apart along a radius of said cam shaft so that the cam shaft may be counter-rotated easily to a rest position.

4,544,046

OVER-THE-ROAD VEHICLE AUTOMATIC SLACK ADJUSTER

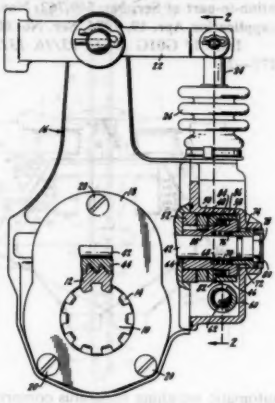
Frederic Lissau, Chicago, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Nov. 28, 1983, Ser. No. 555,647

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—79.5 K **12 Claims**

1. In an automatic slack adjuster for vehicle brakes and adapted to be mounted between the brake chamber and the brake operating shaft, a body, a drive member movable relative to and positioned by said body on the brake operating shaft, a lever arm pivoted to said body, an adjustable connection between said lever arm and drive member for adjusting the relationship between said drive member and body in response to the body movement required for a brake application, said adjustable connection including spring means compressed by



movement of said lever arm when slack is sensed during brake application and providing the energy to cause slack adjusting relative movement between said drive member and body during brake release.

4,544,047

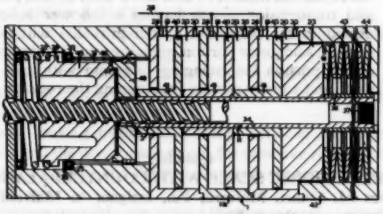
SPRING-APPLIED, AIR-RELEASED, SLACK-ADJUSTING PARKING BRAKE

Quentin T. Clemmons, Irwin, and Paul F. Czerniewski, Jeannette, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Continuation-in-part of Ser. No. 185,060, Sep. 8, 1980,. This application Mar. 10, 1983, Ser. No. 474,217

Int. Cl.[4] F16D *65/24*

U.S. Cl. 188—170 **6 Claims**



1. A spring-applied, fluid pressure released parking brake device for use on a railway vehicle equipped with a conventional tread brake unit including a brake lever for operating brake shoes, said parking brake device comprising:

(a) a cylindrical housing;

(b) a non-rotating spindle coaxially disposed in said housing and provided with a fast-pitch screw thread, said spindle being connectable to such brake shoe such that when moved axially in a first direction, a brake application occurs, and when moved in a second direction opposite to said first direction, a release of the brake occurs;

(c) a fast-travel nut rotatably carried on said spindle;

(d) a clutch seat member axially slidable in said housing in surrounding relation to said spindle and adjacent said fast-travel nut;

(e) clutch means formed partly on said nut and partly on said clutch seat member, said clutch means being effective,

when engaged, for locking said nut in coupled relation with said spindle for causing axial movement of said spindle coincidentally with axial movement of said nut and being effective, when disengaged, for permitting free rotation of said nut to allow axial movement of said spindle independently of said nut;

(f) a plurality of axially aligned, substantially similar, stacked pistons coaxially disposed in said housing in consecutively abutting relation with each other and in abutting contact with said clutch seat member;

(g) pressure chambers formed on one side of each of said stacked pistons and vent chambers formed on the side opposite thereof;

(h) spring means disposed in said housing and acting through said stacked pistons for exerting an axially directed spring force in a direction coinciding with said first direction, on said clutch seat member for causing engagement of the clutch means and consequent movement of said spring in said first direction;

(i) said pistons being subjectable to a control fluid pressure for exerting an axially directed force effecting disengagement of said clutch means, and

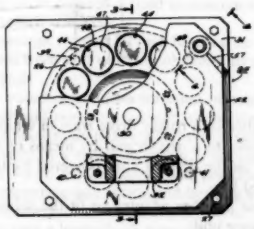
(j) a hollow guide rod coaxially mounted in said housing and extending through said pistons and threadedly engaged with said clutch seat member, said hollow guide rod being surrounded by a spring sleeve on at least a portion thereof, said spring sleeve being further in contact with a threaded nut which is threadably engaged to said hollow guide rod such that axial movement of said pistons can cause axial movement of said spring sleeve.

4,544,048

MAGNETIC FRICTION DEVICE

David L. Hoffman, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 263,663, May 14, 1981, Pat. No. 4,417,356.
This application Jul. 15, 1983, Ser. No. 514,321
Int. Cl.⁴ F16D *69/02*
U.S. Cl. 188—251 A **14 Claims**



1. Apparatus comprising two members that are required to stay in a fixed position relative to each other when a force that has been applied to move one of the members has been discontinued,

means for holding the members in proximity with each other with a gap between them but permitting one member to move in parallelism relative to the other,

one of the members having a planar surface defined by magnetic material,

the other member having a planar surface defined by non-magnetic material and having a recess presented toward the planar surface of the magnetic material of said one member,

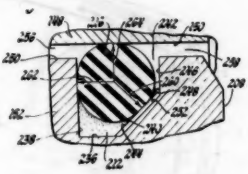
a permanent magnet element having a planar surface and being contained in the recess of the other member, said element fitting closely within said recess but being movable in a direction perpendicular to its planar surface for being attracted to the magnetic material to develop a frictional force sufficient to prevent movement of one member relative to the other which force must be overcome to move one member relative to the other by manual application of force to one of said members, said magnet element being comprised of a polymer containing magnetized particles.

4,544,049

WHEEL CYLINDER ASSEMBLY AND SEAL ARRANGEMENT THEREIN

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1983, Ser. No. 539,272
Int. Cl.⁴ F16D *51/24*
U.S. Cl. 188—364 **3 Claims**



1. A wheel cylinder assembly and mount therefor for a wheel brake assembly, said wheel cylinder assembly and mount comprising;

a guide and support plate having a notch formed therein and arms defining the side walls of said notch;

a wheel cylinder assembly including:

a wheel cylinder body having opposite ends and a bore therethrough defining a cylinder wall;

first and second pistons reciprocably received in said bore and having outer cylindrical surfaces, adjacent inner ends and opposite outer ends, and an axis common with said bore, said inner ends and said cylinder wall defining a pressure chamber;

each of said pistons having a groove in the outer cylindrical surface thereof adjacent the piston inner end and defined by a bottom wall and non-parallel side first and second side walls so that the open side of the groove has a greater axial length than the axial length of said bottom wall, said first side wall having a planar surface which is perpendicular to said axis, each of said pistons further having a socket recess formed in the outer end thereof and adapted to receive means for moving a brake shoe;

an O-ring seal in each of said grooves radially outward of said groove bottom wall and sealingly engaging each of said groove side walls and extending outwardly beyond said groove and sealingly engaging said cylinder wall;

each of said O-ring seals being radially compressed against each of said groove side walls and said cylinder wall by three-point suspension forces so as to be slightly deformed in cross section, the amount of the suspension force acting on said cylinder wall being controlled primarily by the angles of said side walls may be relative to said cylinder wall and thus controlling the drag force of said O-ring on said cylinder wall;

means formed in said second groove side walls which are nearer said piston inner ends providing fluid passages from said pressure chamber to transmit brake fluid actuating pressure into the spaces radially between said groove bottom walls and said O-ring seals;

and an annular wiper seal secured to the outer end of each of said pistons and engaging said cylinder wall in sealing and wiping relation;

said cylindrical body having means for introducing brake fluid under pressure into said pressure chamber to move said pistons in axially opposite directions to actuate a wheel brake assembly, said cylindrical body further having a mounting slot formed across each cylindrical body

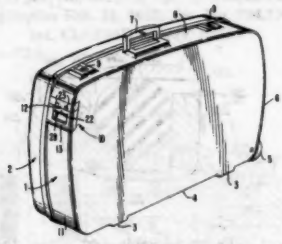
and receiving an arm of said guide and support plate to mount said wheel cylinder assembly on said guide and support plate and in said notch.

4,544,050

HANDLE FOR WHEELED SUITCASE

André G. Seynhaeve, Senlis, France, assignor to Societe Delsey, France

Filed Mar. 4, 1983, Ser. No. 472,258
Claims priority, application France, Mar. 12, 1982, 82 04202
Int. Cl.[4] A45C *5/04, 13/22*
U.S. Cl. 190—115 **15 Claims**



1. A suitcase, comprising:

first and second shells, each of said shells having a large face, a lower face, an upper face and first and second opposite transverse faces;

at least one wheel projecting at a lower end of one of said first transverse faces and rotatable about a wheel axis; and

a pulling handle on one of said shells adjacent an upper end of one of said second transverse faces, said handle including

a single, one-piece, elongated support member fixed to one of said shells parallel to said wheel axis, and

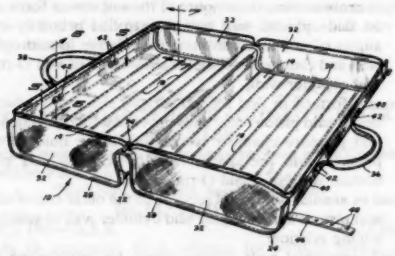
a gripping member having sections forming a closed loop, one of said sections being hinged to said support member and having first and second external lugs extending perpendicular to said wheel axis, each of said lugs having at least one swivel pin pivotally engaging said support member and extending coaxially relative to said support member.

4,544,051

LUGGAGE UTILIZING SERIES OF FABRIC-COVERED BATTENS

Ira M. Saltz, 341 Greenlawn Rd., Greenlawn, N.Y. 11740

Filed Jan. 16, 1984, Ser. No. 571,221
Int. Cl.[4] A45C *13/00, 13/36*
U.S. Cl. 190—124 **7 Claims**



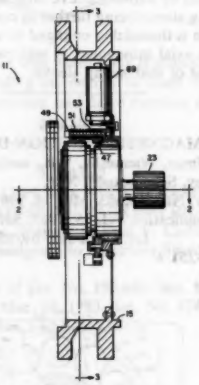
1. A luggage case or bag comprising outer and inner layers of flexible sheet material, a series of closely spaced parallel battens sandwiched between said layers, rows of stitching passing through said outer and inner layers in the spacing between adjacent battens to pull said outer and inner layers together along lines extending in said spacing between adjacent battens to form sheath-like pockets, each pocket containing a batten therein, whereby said battens can pivot or angle relative to each other along the particular row of stitching therebetween, belting at the ends of the luggage, and additional stitching passing through the inner and outer layers of flexible sheet material at the ends of said battens, said additional stitching also passing through a marginal portion of said belting.

4,544,052

RESETTABLE DISCONNECT DEVICE FOR ROTATING MACHINES

Raymond W. Borden, Farmingdale, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 12, 1984, Ser. No. 588,626
Int. Cl.[4] F16D *7/02, 23/00, 43/20*
U.S. Cl. 192—56 R **18 Claims**



1. Apparatus for a rotary drive train in which a driving unit transfers power to a driven unit by means of a rotating drive connection, on the driving unit, powered by the driving unit, characterized by:

(a) an input member adapted to fit the drive connection on the driving unit;

(b) an output member;

(c) an intermediate member displaceable with respect to the input member and the output member;

(d) a first coupling on the intermediate member for transferring rotary movement of the first member to rotary movement of the intermediate member and a second coupling on the intermediate member for transferring rotary movement of the intermediate member to rotary movement of the output member, one of the first and second couplings being releasable and the other of said couplings remaining engaged;

(e) release means having a disengage position and an engage position, the release means being biased toward the disengage position;

(f) latch means to retain the release means in the engage position, the latch means being selectively releasable;

(g) means to release said releasable coupling in response to the release means moving to the disengage position; and

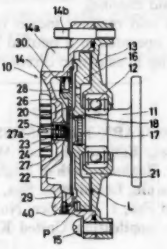
(h) means to engage said releasable coupling in response to the release means moving to the engage position.

4,544,053

TEMPERATURE-RESPONSIVE FLUID COUPLING DEVICE

Hiroji Yamaguchi, Kariya; Masaharu Hayashi, and Masato Itakura, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 8, 1983, Ser. No. 511,937
Claims priority, application Japan, Jul. 12, 1982, 57-120820
Int. Cl.⁴ F16D *31/00*
U.S. Cl. 192—58 B **6 Claims**



1. A temperature-responsive fluid coupling device for driving a cooling fan of an internal combustion engine, said coupling device comprising:

a driving shaft driven so as to be rotated by said engine;

a housing member rotatably mounted on said driving shaft;

a rotor located in a hollow interior of said housing and connected with said driving shaft;

a partition plate dividing said hollow interior into a reservoir chamber for a viscous fluid and a working chamber accommodating said rotor therein;

a fluid return passage formed in said partition plate to cause said viscous fluid to return from said reservoir chamber to said working chamber;

a valve plate rotating on said partition plate in response to changes in temperatures of a cooling water in an engine radiator so as to control a fluid communication through said fluid return passage;

a pumping passage formed in said housing to transfer said viscous fluid from said working chamber to said reservoir chamber; and

a ball check valve mechanism installed in said fluid return passage and said pumping passage, respectively;

said valve mechanism including a ball check valve located in a slidable state in a radial direction, a spring biasing said ball check valve toward its closed position, and a cap member supporting said spring and limiting a distance of a sliding movement of said ball check valve;

said spring having a load which is so established such that in a stopping process of said engine at first said fluid return passage is brought and maintained in its closed state and next said pumping passage is brought and maintained in its closed state respectively.

4,544,054

MOUNTING SHAFT AND ADAPTOR FOR VISCOUS COUPLING

Richard J. Brown, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 356,079, Mar. 10, 1982, abandoned.
This application Oct. 22, 1984, Ser. No. 663,814
Int. Cl.⁴ F16D *35/00, 1/02*
U.S. Cl. 192—58 B **10 Claims**

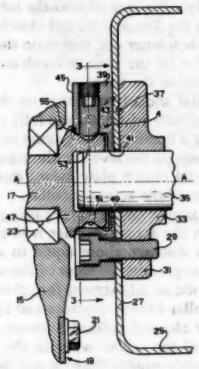
1. An assembly for mounting an input shaft coaxially with a fluid coupling having a first rotatable member defining a fluid chamber, a second rotatable member disposed within said fluid chamber, said fluid chamber including a volume of fluid for transmitting torque from one of said first and second members to the other of said first and second members in response to relative rotation therebetween and said second rotatable member including a coupling shaft, said assembly comprising:

(a) a boss portion on said coupling shaft having an annular, hollow extension defined by lines surrounding the axis of said coupling shaft, said hollow extension receiving and piloting a forward end portion of said input shaft;

(b) a contact surface on said extension;

(c) a surface on said boss portion extending radially relative to said coupling shaft axis;

(d) an adaptor secured to said input shaft for one-to-one rotation and having an opening configured to receive said



extension of said boss portion, said opening being defined by lines surrounding the axis of said input shaft, whereby the assembly of said coupling shaft and said input shaft is substantially foreshortened;

(e) a surface on said adaptor extending radially relative to said input shaft and configured for mating engagement with said radially extending surface on said boss portion; and

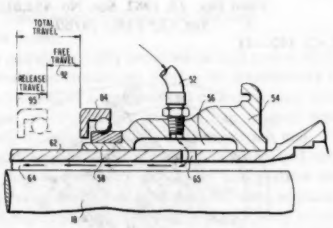
(f) means engageable with said adaptor to contact said contact surface on said extension and force said extension into said adaptor opening and said radially extending surfaces into engagement.

4,544,055

OIL SHUT-OFF DEVICE FOR WET CLUTCHES

Victor Kronstadt, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Aug. 31, 1982, Ser. No. 413,270
Int. Cl.⁴ F16D *13/56, 13/72*
U.S. Cl. 192—70.12 **6 Claims**



1. A wet clutch with oil cutoff during disengagement, comprising:

a housing,

a drive member extending into the housing and having first clutch plate means mounted thereon,

a driven member extending into the housing and having

second clutch plate means mounted thereon in operative relationship with the first clutch plate means,

one of said members including a shaft and a hub mounted on the shaft supporting the corresponding clutch plate means,

a tube mounted on the housing and extending coaxially over the shaft in spaced relationship to the shaft to form an annular conduit for oil,

said tube having a distal open end adjacent the hub,

said hub having means for directing oil from the distal open end of the tube to both of the clutch plate means,

clutch pressure and release means including a plurality of levers radially extending around the tube for disengaging and engaging the first and second clutch plate means with each other when inner end means on the levers is pivoted axially relative to the tube toward and away from the open distal end of the tube,

an actuator collar slidably mounted on the tube for movement between fully advanced and fully retracted positions and including a bearing for engaging and disengaging the inner end means on the levers to disengage and engage the first and second clutch plate means during advancement and retraction of the actuator collar,

said inner end means on the levers being spaced from the bearing when the actuator collar is in the fully retracted position by a distance about equal to a change in lever position due to permissible wear of the clutch plate means so as to provide an adjustment free clutch,

said actuator collar having opposite and lip portions and an inner annular channel defined between the opposite end lip portions of the collar wherein the opposite end lip portions slideably engage the tube and the annular channel forms an axially movable annular chamber surrounding the tube

means in the housing for collecting and supplying oil under pressure to the annular chamber, and

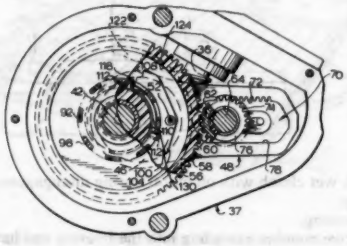
a plurality of radial openings in the tube positioned for communicating between the annular chamber and the annular conduit when the actuator collar is in any position between the fully retracted position and an intermediate advanced position which corresponds to at least about 0.02 millimeter clutch plate lift per pair of new clutch engaging surfaces and for being substantially closed from the annular chamber by a trailing lip portion of the end lip portions when the actuator collar is advanced to a position between the fully advanced position and the intermediate position.

4,544,056

SOLENOID OPERATED NEUTRAL PUMP-OUT FOR AUTOMATIC WASHER

Thomas H. Buckleitner, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 23, 1982, Ser. No. 452,612
Int. Cl.[4] F16D *13/60*
U.S. Cl. 192—71 **10 Claims**



1. In an automatic washer transmission for operating the washer in the agitate and spin modes, means for operating said transmission in a neutral state comprising:

a reversible drive gear for driving said transmission in a first agitate direction and an opposite spin direction;

a drive pawl pivotally mounted on said drive gear, said drive pawl having an arcuate channel formed therein;

pawl retaining means rotatable about an axis relative to said pawl and mounted for movement parallel to said axis into and out of said channel; and

actuator means for moving said pawl retaining means into and out of said channel,

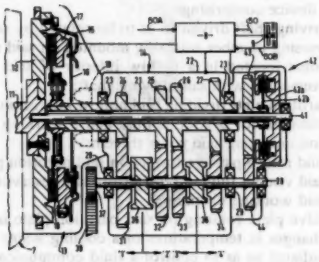
whereby when said retainer means is in said channel, said transmission operates in a neutral state when said drive gear is rotating in said spin direction.

4,544,057

ROTARY TRANSMISSION

Henry G. Webster, Kenilworth, and Wilfred N. Bainbridge, Overthorpe, Nr. Banbury, both of England, assignors to Automotive Products plc, Leamington Spa, England

Filed Feb. 1, 1983, Ser. No. 463,034
Claims priority, application United Kingdom, Feb. 5, 1982, 8203394
Int. Cl.[4] B60K *41/28*; F16H *3/08*
U.S. Cl. 192—0.076 **11 Claims**



1. A motor vehicle engine and transmission combination comprising a drive clutch, an input shaft for the transmission to which drive is transmitted from the engine by the drive clutch, an output shaft for the transmission, a plurality of gear trains which provide a series of increasing drive ratios between the input shaft and the output shaft, each gear train comprising a gear wheel on the input shaft and a gear wheel selectively drivably connectable to the output shaft by selector means, automatic change speed means to operate said selectors, and a further clutch having a driving member drivably connected to said engine, said further clutch being responsive to said change speed means to control the engine speed during a ratio change between one said ratio and the next higher ratio with said drive clutch disengaged to substantially synchronize engine speed with the speed of said transmission input shaft speed, said further clutch having a driven member drivably connected to the transmission output shaft to enable drive to be transmitted between the engine and the transmission output shaft during the speed ratio change with the drive clutch disengaged.

4,544,058

COIN ACCEPTOR

Nathan Choderker, 1880 S. Ocean Dr., Hallandale, Fla. 33009; Carl E. Dorman, 7155 W. 14th Ct., Hialeah, Fla. 33014; Ian Richter, 906 Nautilus Isle St., Dania, Fla. 33004, and Richard Driver, 2997 Newfound Harbor Dr., Merritt Island, Fla. 32952

Filed Apr. 4, 1984, Ser. No. 596,708
Int. Cl.[4] G07D *5/02*
U.S. Cl. 194—102 **6 Claims**

3. A coin acceptor for accepting or rejecting; testing the

diameter, thickness, and mass of a coin and directing the same to adjacent accept and reject chutes comprising, in combination,

an enclosed housing having a front and back plate,

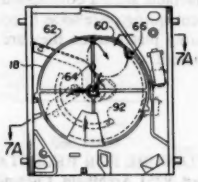
a coin insert slot in an upper portion of said housing,

a coin path in open communication with said slot having a beveled track,

a coin carrier rotatably mounted within the housing about an axis,

a cam in the housing mounted with regard to the carrier and having a runway defining surface and coin path defined by a second beveled track,

said runway defining surface being beveled inwardly and



downwardly toward the back plate for a thin coin to drop into, thereby reducing its effective diameter,

coin engaging means on the carrier,

said cam opening the distance between its surface and the coin engaging means between the four o'clock and six o'clock positions, thereby dropping a low mass coin before the six o'clock position is reached but retaining a proper diameter and mass coin to pass the six o'clock position,

a divider at a lower portion of the housing defining an accept and reject chute,

and stop means for the carrier to terminate its rotation by a falling coin at a point where said coin is proximate the divider.

4,544,059

APPARATUS FOR COMBINING SEVERAL ROWS OF BOTTLES OR SIMILAR OBJECTS ON AN INLET CONVEYOR TO A SINGLE ROW ON AN OUTLET CONVEYOR

Erik C. Mernoe, Virum, Denmark, assignor to De Forenede Bryggerier A/S, Copenhagen, Denmark

PCT No. PCT/DK82/00061, § 371 Date Feb. 16, 1983, § 102(e) Date Feb. 16, 1983, PCT Pub. No. WO83/00135, PCT Pub. Date Jan. 20, 1983

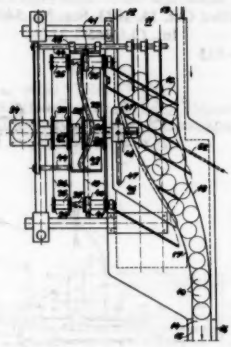
PCT Filed Jul. 1, 1982, Ser. No. 468,051

Claims priority, application Denmark, Jul. 3, 1981, 2963/81

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—453 **13 Claims**

1. An apparatus for combining bottles or similar objects fed on an inlet conveyor on which they form inclined rows, into a single row on an outlet conveyor operating at a speed substantially equal to the number of objects in each row times the speed of the inlet conveyor, in which the improvement comprises: a plurality of oblong separators mounted and controlled so as to extend across the inlet conveyor substantially in parallel with the rows of bottles and to move in a closed path and means for causing the separators to move so that on at least a part of the path the separators have a velocity having a main component parallel to the inlet conveyor and a relatively small component perpendicular thereto, and in which path, the separators, from above, move down between each two adjacent rows of bottles and follow them during the last part of their movement on the inlet conveyor towards an inclined guide rail which forms a smaller angle with the inlet conveyor



than the separators and transfers the bottles to the outlet conveyor.

4,544,060

CHIP TRANSPORTING CONVEYOR

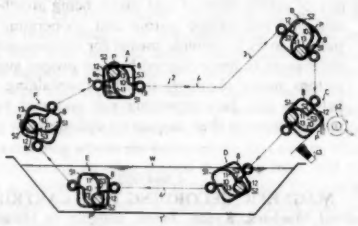
Yukio Enomoto, Kakamigahara, Japan, assignor to Enomoto Industry Co., Ltd., Japan

Filed Dec. 22, 1983, Ser. No. 564,743

Claims priority, application Japan, Dec. 28, 1982, 57-230030; Mar. 14, 1983, 58-42718; Apr. 7, 1983, 58-61136; Apr. 21, 1983, 58-70682

Int. Cl.[4] B65G *15/58*

U.S. Cl. 198—495 **18 Claims**



1. A chip transporting conveyor comprising:

a conveyor frame;

an endless carrier movably mounted on said conveyor frame and operable in circulatory motion for transporting chips and discharging at a terminal end of a conveyor zone;

said endless carrier having at least one magnet housing extending transversely of the endless carrier; and

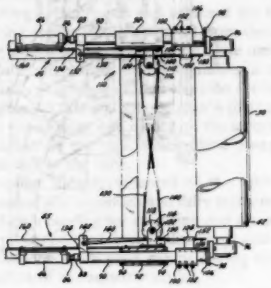
a permanent magnet body accommodated in said magnet housing and movable by gravity as said endless carrier travels in circulatory motion therein between an attractive position in which said permanent magnet body is located adjacent to an inner wall surface of said magnet housing for attracting the chips to an attracting surface of said magnet housing while the chips are being transported and an unattractive position in which said permanent magnet body is located remotely from said inner wall surface for discharging the chips off said magnet housing when the latter is inverted around said terminal end.

4,544,061

BELT PRESS

Robert E. Crandall, Greendale, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Oct. 11, 1983, Ser. No. 540,461
Int. Cl.[4] B65G *23/44*
U.S. Cl. 198—813 **7 Claims**



1. In a belt press which includes a frame, a plurality of rolls, and a continuous belt which passes over said rolls, the improvement comprising a belt tensioning system, comprising:

first and second fluid actuators, one of said actuators located on each side of said belt;

first and second pistons extending from each of said actuators;

means mounting said actuators and pistons on longitudinal members of said frame such that the motion of the pistons is constrained to be parallel to the direction of travel of said belt;

a belt tensioning roll mounted on said pistons in contact with said belt, the axis of said belt tensioning roll being perpendicular to the direction of travel of said belt;

a plurality of pulleys rotatably fixed on said frame; and

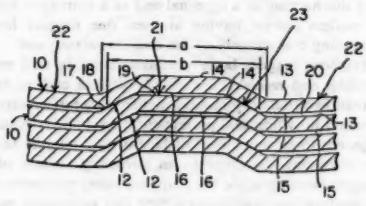
a pair of cables, each of said cables being attached to both said first and second pistons and cooperating with said pulleys so as to provide means for compensating for the differences in force exerted by said pistons such that the pistons move together, thereby maintaining the angle between said belt tensioning roll and said belt as said pistons move in their respective cylinders.

4,544,062

MAGNETIC RECORDING TAPE CARTRIDGE

Yoshimi Maehara, Kyoto, Japan, assignor to Hitachi Maxell Ltd., Osaka, Japan

Filed Mar. 11, 1983, Ser. No. 474,449
Claims priority, application Japan, Mar. 13, 1982, 57-34638
Int. Cl.[4] G03B *1/04*; B65D *21/02*
U.S. Cl. 206—509 **7 Claims**



1. A magnetic recording tape cartridge assembly comprising:

a cartridge case having projecting bosses formed on an inner wall thereof;

a pair of tape reels contained in said case; and

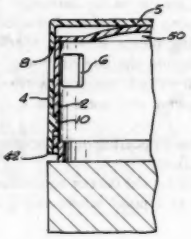
a spring plate having an intermediate bridge portion which is provided with holes corresponding to said bosses, and a pair of supporting arm portions extending symmetrically from said intermediate bridge portion and assembled in said cartridge case through the engagement of said holes with said bosses for resiliently and rotatably supporting said pair of tape reels, said spring plate being provided with at least one projecting means which is formed at said intermediate bridge portion in a position between said holes said projecting means defining a concavity which compliments said projection to form a tapered portion that is contactable with a corresponding tapered portion of an adjacent spring plate so as to provide gaps between adjacent spring plates when they are stacked before the assembly thereof.

4,544,063

CLOSURE FOR RECEPTACLE

Lance M. Neward, 9251 Archibald, Cucamonga, Calif. 91730

Filed Oct. 5, 1984, Ser. No. 658,151
Int. Cl.[4] B65D *83/04*
U.S. Cl. 206—540 **15 Claims**



1. A receptacle, comprising:

a cylindrical container, comprising a base, a cylindrical sidewall connected to the base and a first opening in the cylindrical sidewall;

a cap connected to the container, comprising an outer top, an outer sidewall connected to the outer top and a second opening in the outer sidewall;

a cap retention means connecting the container and the cap, said retention means preventing removal of the cap from the container;

biasing means applying a force on the cap to urge the cap away from the container;

means for allowing rotation of the cap about the cylindrical sidewall;

means for allowing the cap to be vertically displaced relative to the base;

a first stop means which maintains the cap and the container in a closed position in which the first opening and the second opening are totally non-aligned to prevent access to the interior of the container, said first stop means preventing substantial movement of the cap absent an external force applied to the receptacle to overcome the force applied by the biasing means and the resistance provided by the rotation lock means; and

rotation lock means, said lock means providing resistance to rotation of the cap about the cylindrical sidewall from a first position wherein the first and second openings are totally non-aligned to a second position wherein the first and second openings are at least partially aligned.

4,544,064

DISTRIBUTION INSTALLATION FOR MOVING PIECE GOODS

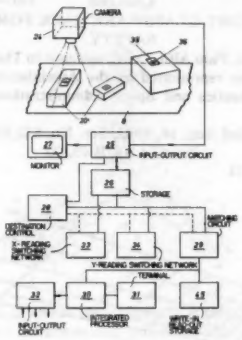
Christian Felder, Dreieichenhain, Fed. Rep. of Germany, assignor to Gebhardt Fordertechnik GmbH, Fed. Rep. of Germany

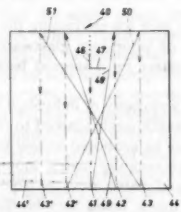
Filed Feb. 2, 1983, Ser. No. 463,319

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204021

Int. Cl.[4] B07C 3/10; G06K 9/34

U.S. Cl. 209—583 23 Claims





1. A distribution installation for piece goods moved along a conveyor track which are distributed from a common feed track to several stations of a distribution track, each piece good being provided with a coding containing an information which is contactlessly detected within the area of an objective field of a detection station located upstream of the distribution track by a video camera means connected to an electrical evaluating circuit means for determining the exit information belonging to an associated station of the distribution track, said video camera means being directed from above and substantially perpendicularly onto the conveyor track plane of the detection station, each said piece good being conveyed through the objective field of the video camera means in a non-oriented manner in the transverse direction and angularly independently about the vertical axis with an upwardly facing coding within the objective field, the coding including a single bar group containing the information, the bar group including at least one positioning bar means utilized for determining the angular position of the coding when detected at said detection station, said circuit means evaluating the coding subsequent to detection of the orientation of the positioning bar means in order to determine the exit information and subsequent further transmittal of the respective piece good to the coordinated station of the distribution track, the search operation for searching the coding inside of the objective field being so constructed that image points are initially examined for a predetermined length of time on a center search line parallel the conveyance direction and subsequently alternately on right and left search lines disposed laterally adjacent the center search line until a light-dark transition takes place, upon said light-dark transition occurring a predetermined number of successive image points in the search direction and thereafter a predetermined number of image points at a right angle to the search line are examined until a dark-light transition is detected.

4,544,065

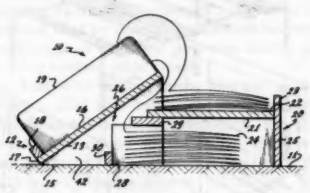
PRINTER STAND

Carl J. Mueller, 524 Iroquois Trail, Carol Stream, Ill. 60188

Filed Feb. 9, 1984, Ser. No. 578,674

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—13 6 Claims



1. A stand for supporting a computer printer or the like, comprising a base unit defining a first support surface dimensioned to receive a printer or the like thereupon and inclined relative to horizontal, and a lip member along at least a portion of the forward or lower marginal edge of said first support surface and extending upwardly therefrom, said lip member being engagable on one side thereof with said printer whereby to prevent said printer from sliding off said first support surface, said base unit having a first cavity subjacent said first support surface dimensioned to receive at least partially a supply of continuous-web folded paper for said printer, said base unit having as rear opening, communicating with said first cavity, a separate bailer unit positioned rearwardly of said base unit, said bailer unit defining a second support surface dimensioned to fit telescopically through said rear opening of said base unit and into said first cavity, and to receive refolded paper thereupon ejected by said printer, said bailer unit further defining a second cavity subjacent said second support surface and having a front opening for communicating with said rear opening in said base unit and being dimensioned to receive partially the supply of continuous-web paper for said printer to permit said first and second cavities to communicate and to permit said paper to be positioned wholly within the combination of said first and second cavities, a cross member for said bailer unit extending across the inside of the first cavity of said base unit and having an edge spaced inwardly from said rear opening at a position above the paper near the front edges thereof disposed within said first cavity for guiding said continuous-web paper upwardly and rearwardly out of said first cavity and to the printer.

4,544,066

PRINTED WIRING BOARD FILE EMPLOYING WIRE STRUCTURAL MEMBERS

James V. Koppensteiner, Chicago, and John E. Kaczkos, Elk Grove Village, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed May 17, 1984, Ser. No. 611,237

Int. Cl.[4] H05K 1/14

U.S. Cl. 211—41 9 Claims

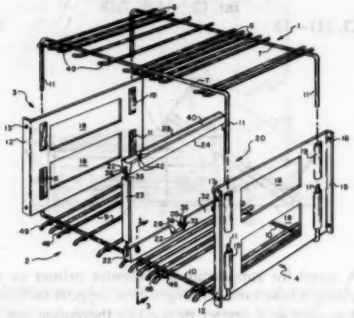
1. A printed wiring board file for use with at least a pair of printed wiring boards including longitudinally channeled upper and lower edges, and file comprising:

at least two upper guide tracks, each track of single straight wire construction and arranged to be engaged with a corresponding one of said printed wiring board channel upper edges;

at least two lower guide tracks, each track of single straight

wire construction and arranged to be engaged with a corresponding one of said printed wiring board channel lower edges;

at least one upper lateral positioning member and at least one lower lateral positioning member, both positioning members of elongated construction and each including a first and a second end, said upper guide tracks to position said tracks in spaced relation to each other, said lower positioning member attached to each of said lower guide tracks to position said tracks in spaced relation to each



other, said upper guide tracks and said lower guide tracks spaced in relation to each other in a like manner; and

a first and a second side member connected to said upper and said lower positioning members at a corresponding end thereof, said side members retaining said positioning members in fixed parallel relation to each other with a corresponding one of said upper guide tracks and a corresponding one of said lower guide tracks positioned parallel to and above one another, said upper and lower guide track pair defining a single card mounting position.

4,544,067

MAGNETIC TOOL HOLDER

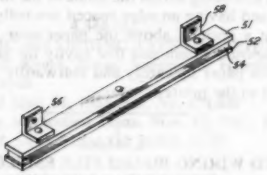
Merrill R. Miller, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Continuation-in-part of Ser. No. 464,407, Feb. 7, 1983, Pat. No. 4,451,810. This application Mar. 28, 1984, Ser. No. 594,120

The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.[4] A47F *5/08*

U.S. Cl. 211—70.6 **1 Claim**



1. An improved magnetic tool holder comprising, in combination:

a pair of equally sized, generally rectangular, metal plates;

a single magnetic bar having longitudinal and width dimensions slightly less than the corresponding dimensions of the plates, said bar comprised of a flexible material impregnated with a magnetic powder material;

at least two L-shaped bracket members having a support leg and a fastening leg, said fastening leg having a length slightly less than the width of the plates, said fastening leg positioned on the surface of a metal plate with the support leg projecting from said surface away from the other metal plate; and

at least two fasteners connected entirely through a series of aligned openings in an assembly stack of the plates with the bar therebetween and the fastening leg against said surface of one plate and with the support leg projecting from the one plate, the junction of the legs aligned against the longitudinal aligned edges of the plates and bar, each support leg spaced laterally from the other, each support leg extending transversely from the assembly stack and including an opening for attachment and support of the holder, one fastener being associated with each bracket member to maintain the holder in assembled condition.

4,544,068

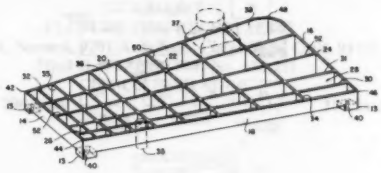
LABORATORY GLASSWARE RACK FOR SEISMIC SAFETY

Marc M. Cohen, Palo Alto, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 16, 1983, Ser. No. 523,991

Int. Cl.[4] A47B *73/00*

U.S. Cl. 211—74 **2 Claims**



1. A rectangular rack for restraining the lateral motion of a diverse collection of laboratory glassware containers having bottom surfaces resting on a support beneath the rack, said rack comprising:

a base comprising a plurality of individual feet, each foot having an orifice therethrough adapted to receive a fastener so that said feet may be anchored to said support;

a self-supporting rectangular matrix mounted on top of said base with all of said matrix elevated from the bottom surface of said base so that a liquid may be flushed between said support and said matrix to carry away any spillage from said containers, said matrix comprising:

a first plurality of vertical parallel longitudinal walls, a second plurality of vertical parallel lateral walls, said second plurality of walls being perpendicular to said first plurality of walls and intersecting therewith to form a plurality of rectangular compartments open at the top and bottom and adapted to surround and restrain glassware containers placed therein while the bottom surfaces of the containers rest on said support, said intersecting walls being of the same height at the point of intersection, said walls of said matrix including a front wall, a rear wall, a left-most wall and a right-most wall;

said front and left-most walls being rectangularly shaped whereas the other walls have a linear-sloped upper edge where the slope increases positively from left to right for the longitudinal walls and increases positively from front to rear for the lateral walls, the slopes of said sloped longitudinal walls successively increasing from the front to the rear of the matrix and the slopes of the sloped lateral walls successively increasing from the left to the right of the matrix, the upper edges of the walls thereby collectively defining a curved surface and

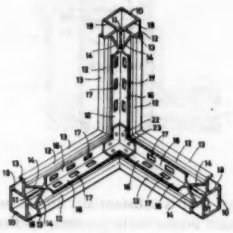
the spaces between adjacent longitudinal walls being successively larger in the direction from the front to rear of the matrix, and the spaces between adjacent lateral walls being successively larger in the direction from the left to the right of the matrix whereby the size of the matrix rectangular compartments progressively increase in height and girth from the front-left corner to the rear-right corner.

4,544,069

MODULAR ELEMENTS FOR COMPOSING FRAMES FOR THE CONSTRUCTION OF CABINET STRUCTURES AND CONTAINERS FOR ELECTRICAL, ELECTROMECHANICAL AND ELECTRONIC COMPONENTS, FOR INTERNAL AND EXTERNAL USE

Gianfranco Cavallini, Via Rieti, 23, 10095 Grugliasco, Torino, Italy

Filed May 8, 1984, Ser. No. 608,236
Claims priority, application Italy, May 26, 1983, 53387/83[U]
Int. Cl.⁴ A47F *5/00*
U.S. Cl. 211—183 **9 Claims**



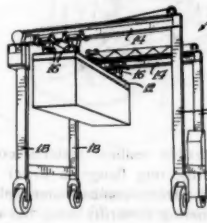
1. Modular elements for composing frames for the construction of cabinet structures and containers for electrical, electromechanical and electronic components, for internal and external use, said elements forming the perimetral cabinet frame defined by section bars and angle pieces connected together, characterised in that the angle pieces are constituted by a corner portion from which there extend several mutually orthogonal tube portions of substantially quadrilateral cross-section; each of said section bars comprising a tubular element of orthogonal shape arranged for insertion onto one of said tube portions and further comprising, extending from one corner thereof in mutually orthogonal directions, two flanges from which there extend two further converging and intersecting flanges, from which intersection there extend two mutually orthogonal profiled portions being provided with means arranged for supporting electronic and electromechanical containers.

4,544,070

SWAY CONTROL ARRANGEMENT FOR HOIST SYSTEMS

Emory J. Sickler, Wausau, Wis., assignor to Mi-Jack Products, Inc., Hazelcrest, Ill.

Filed Feb. 16, 1983, Ser. No. 466,736
Int. Cl.⁴ B66C *13/06, 5/02*
U.S. Cl. 212—147 **2 Claims**



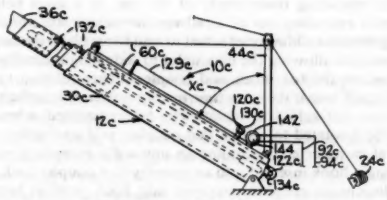
1. A mobile gantry crane comprising:
frame means;
a vertically movable load lifting structure;
hoist means including cables for suspending and raising and lowering said lifting structure and a load connected thereto;
means for controlling sway of said suspended load including sway control cable means connected to said lifting structure;
means for reeling and unreeling said sway control cable means;
means for supplying pressurized hydraulic fluid;
stabilizing hydraulic motor means adapted to receive pressurized fluid from said fluid supplying means for driving said reeling means to reel said sway control cable means during pressurized hydraulic fluid flow through said motor means in a first direction, said motor means being adapted to hydraulically dampen and control sway of said suspended load by receiving restricted reverse fluid flow therethrough in a second direction during unreeling of said sway control cable means;
reverse fluid flow circuit means adapted to communicate between a fluid inlet and a fluid outlet of said stabilizing hydraulic motor means for permitting reverse flow therethrough, said circuit means including flow restricting means for restricting said reverse fluid flow through said stabilizing hydraulic motor means to hydraulically dampen and control sway of said suspended load, and one-way valve means disposed in series flow relation with said flow restricting means, said one-way valve means being adapted to open for reverse fluid flow through said circuit means in response to fluid pressurization greater than the pressure of fluid from said source; and means to prevent reverse flow of hydraulic fluid to said source of pressurized fluid.

4,544,071

EXTERNAL PENDANT PAY-OUT SYSTEM WITH ANTI-DROOP CONTROL

Darwin N. Poock, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 393,985, Jun. 30, 1982, Pat. No. 4,492,312.
This application Oct. 29, 1984, Ser. No. 649,039
Int. Cl.⁴ B66C *23/04, 23/56, 7/00*
U.S. Cl. 212—264 **5 Claims**



1. A pendant pay-out system for maintaining the working angle of a pendant supported extensible boom substantially constant when the boom is being extended or retracted, said boom being pivoted to support means and including a pivotally supported base section having at least one section telescopically received therein, a live mast supported for pivotal movement relative to said support means and having rotatable pendant supporting means on the free end thereof, and means for pivoting the mast between a lowered position and one of a plurality of raised working positions with one position defining a predetermined mast-boom angle, the improvement which comprises: a pendant trained over said rotatable means on said mast and having one end connected to said one boom section and the other end portion supportively connected to said base section, reversible power operated means for taking up or paying out pendant, control means responsive to extension of the boom for actuating said power means to pay out sufficient pendant and responsive to retraction of the boom for actuating said power means to haul in sufficient pendant to maintain said

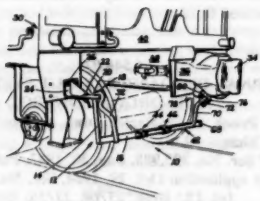
mast boom angle substantially constant during extension and retraction of the boom, said reversible power operated means being directly connected to said boom, said reversible power means includes hydraulic motor means; and wherein said control means comprises electrical control means including a first potentiometer responsive to linear changes in the amount of pendant being taken in or payed out, a second potentiometer responsive to linear changes due to extension and retraction of the boom, and a comparator for receiving signals from said potentiometers; and wherein said control means also includes a hydraulic valve and a servo mechanism for receiving signals from said comparator for shifting said valve; said potentiometers being preset to provide a predetermined output ratio when said mast-boom angle is at said predetermined working angle, said servo mechanism being responsive to changes in said output ratio from said predetermined ratio due to extension or retraction of the boom to shift the hydraulic valve into positions which drive said motor in a direction which pays out or hauls in pendant until said output ratio returns to said predetermined output ratio.

4,544,072

UNCOUPLING DEVICE WHICH COMPLIES WITH AAR SPECIFICATION

Robert W. Randolph, St. Charles, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.

Filed Jan. 7, 1980, Ser. No. 110,431
Int. Cl.⁴ B61G *3/08*
U.S. Cl. 213—166 **11 Claims**



1. An uncoupling device comprising: a handle pivotably mounted at the side of the car; said handle being connected to a bar extending transversely of the car, at a level below a coupler extending out of a railway car center sill; an uncoupling member slidingly attached to said bar with an uncoupling connection allowing the uncoupler to slide longitudinally with respect to the bar when said coupler moves relative to aaid center sill; and at the same time having sufficient interface with the bar that sufficient motion can be transmitted when said handle is rotated to unlock said coupler; said uncoupler member at its outer end including an upwardly extending portion having a hook inserted into an opening in a coupler lock lifter to disconnect coupled couplers; said hook portion being in continuous engagement with said lock lifter and having a portion of reduced thickness to avoid interference between the coupler lifter and said hook portion when the coupler shank is rotated significantly off the centerline of the car, or is moved longitudinally of the center sill.

4,544,073

BOTTLE-OVERCAP COMBINATION

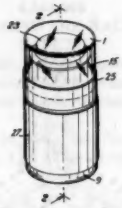
Donald E. Willis, Hazelwood, Mo., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,099
Int. Cl.⁴ B65D *51/18*
U.S. Cl. 215—246 **5 Claims**

1. A bottle and overcap combination designed to give this combination a unitary, uninterrupted, cylindrical appearance when the parts are assembled;

(a) said bottle being provided with a closure and comprising an upper bottle portion and a lower cylindrical body portion having an upper margin, the outside dimension of said upper bottle portion at its greatest horizontal dimension being smaller than the outside diameter of said bottle body portion, said bottle body portion at its upper margin terminating in a seat that extends inwardly and which is adapted to serve as a seat for a lower margin provided for in said overcap; said upper bottle portion having an undercut in its surface near its lower end, said undercut being spaced apart vertically from said seat;

(b) said overcap being cylindrical in form and having an



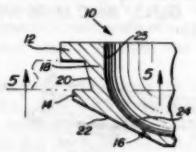
outer diameter that is substantially the same at the outer diameter of said bottle body portion, said overcap being formed with an inner surface having a bead extending inwardly of said overcap inner surface, said bead being spaced vertically from the lower margin of said overcap and positioned so as to engage the undercut on said upper bottle portion when said overcap is snapped into position on said bottle, whereby when said overcap is positioned on said bottle the combination has the appearance of a unitary uniterrupted cylinder.

4,544,074

TAPERED AND FLANGED RUBBER STOPPER

Edward R. Evans, 13418 Halldale Ave., Gardena, Calif. 90249

Filed May 7, 1984, Ser. No. 607,455
Int. Cl.⁴ B65D *39/04*
U.S. Cl. 215—355 **11 Claims**



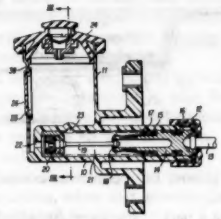
1. A stopper of flexible resilient material comprising an upper peripherally projecting flange, a lower peripherally projecting flange, and a frusto-conical outer wall surface between the flanges tapering inwardly from the upper flange toward the lower flange, and extending all of the way from the bottom of the upper flange to the top of the lower flange, wherein the stopper is of hollow cup-like form with the upper flange defining a rim thereof and the lower flange merging into a closed tapered nose portion of the stopper.

4,544,075

HYDRAULIC PRESSURE CYLINDER WITH INTEGRATED RESERVOIR

Kaoru Nakamura, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 488,621, Apr. 25, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 694,919
Claims priority, application Japan, May 7, 1982, 57-066899
Int. Cl.[4] B65D *25/54*; B60T *17/22*
U.S. Cl. 220—82 R **3 Claims**



1. A hydraulic pressure cylinder with an integrated reservoir, comprising:

a cylinder body of strengthened resin;

a reservoir tank of strengthened resin molded with said cylinder body as one body and having a wall portion, said tank having an opening formed in said wall portion of said reservoir tank so as to define a frame portion;

a window plate formed of resin material soluble in said strengthened resin, separate from said reservoir tank, having a high transparency characteristic and a lower melting point than that of said reservoir tank, and being mounted on an inner surface of said reservoir tank, said window plate having a flange formed along an entire periphery of said window plate and a projecting part which projects from said flange toward an outer surface of said wall portion of said reservoir tank along said frame portion of said reservoir tank; and

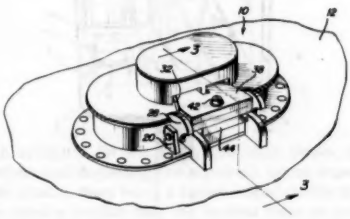
ultrasonic melt bonded connecting means for connecting said flange to said inner surface of said wall portion of said reseroir tank.

4,544,076

LOCKING CAP FOR OIL STORAGE TANK

Don W. Casey, P.O. Box 736, Great Bend, Kans. 67530

Filed Oct. 22, 1984, Ser. No. 663,175
Int. Cl.[4] B65D *55/14, 45/23*
U.S. Cl. 220—210 **8 Claims**



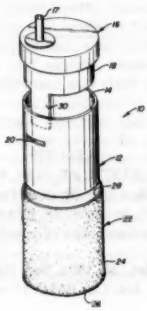
1. In combination with a storage tank including a fill opening and a hinged cap for said fill opening and whereby an outstanding peripheral flange extends about and projects outwardly from said opening, a pair of stationary mounting portions spaced along and disposed outward of one marginal portion of said flange, said cap including a pair of lug portions mounted from one marginal portion thereof and pivotally supported from said mounting portions by a pivot shaft means extending through said lug portions and said mounting portions for swinging of said cap about an axis extending between said mounting portions between a closed position overlying the outer marginal of said peripheral flange and an open position disposed outwardly of and to one side of said opening, a cap lock, said lock including a mount stationarily mounted between said mounting portions and said lug portions by said pivot shaft means and defining a recess opening outwardly thereof in a direction generally paralleling the plane of said opening, a locking body including a first portion removably lengthwise telescopingly receivable in said recess and a second portion positioned in closely spaced overlying relation with the outer surface of said cap when said first portion is telescoped into said recess preventing swinging of said cap from said closed position to said out position, and lock means releasably locking said body in position with said first portion telescoped into said recess.

4,544,077

LIQUID CONTAINER

Hal Rucker, 1103 Woodland Ave., Menlo Park, Calif. 94025

Filed Dec. 17, 1984, Ser. No. 682,399
Int. Cl.[4] B62J *11/00*
U.S. Cl. 220—449 **11 Claims**



1. A liquid container comprising:

a container body of heat conductive material and having an open top;

a top cover shiftably mounted on and closing the open top of the container body, said top cover having outlet means for allowing a liquid to be directed out of the container body;

a liquid absorbing liner surrounding the container body and in thermal interchange relationship thereto; and

valve means coupled with said container body for allowing liquid from the container body to contact the liner so that, when ambient air and the liner move relative to each other, an evaporative cooling effect occurs to cool the liquid in the container body.

4,544,078

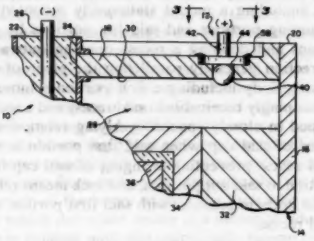
SEALED CLOSURE FOR SEALING AND CLOSING AN OPENING IN A CONTAINER

Alvaro Arenas; John W. Box, both of Miami; Joseph H. Davis, Miami Lakes, and Harshad Tataria, Miami, all of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed May 22, 1984, Ser. No. 613,048
Int. Cl.[4] B65D *51/18*
U.S. Cl. 220—256 **24 Claims**

1. A closure assembly for closing and sealing an opening in a wall of a container for an electrolytic cell having liquid therein, said closure assembly comprising: a first plug member inserted into said opening in a fluid tight manner to establish a first seal, said opening being provided with a counterbore; and a second plug member which is inserted into said counterbore

above said first plug member and said opening, which is permanently fixed to a wall of said counterbore radially outwardly of said opening so that a fluid tight second seal is formed between



said second plug member and said wall thereby to provide a double seal for preventing leakage of liquid from said container through said opening, and which forms a terminal for said electrolytic cell.

4,544,079

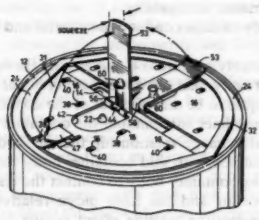
OPENER STRUCTURE FOR A CONTAINER

Edwin Elrick, P.O. Box 358, Black's Harbour, New Brunswick, Canada E0G 1H0, assignor to Edwin Elrick, Blacks Harbour; David L. Lockhart, Fairville and Alfred Hunt, Winona, all of, Canada

Filed Oct. 24, 1984, Ser. No. 664,378

Int. Cl.[4] B65D *17/42*

U.S. Cl. 220—277 **8 Claims**



1. In combination:

a container body including a wall intended to be opened,

a slidable plate juxtaposed against said wall externally of the container body,

retention means retaining said plate against said wall while permitting relative sliding between them,

a resilient punch supported by the plate and having a piercing edge biased toward the wall, the punch resting on a shelf-like portion of the wall in biased condition, the wall having a region of weakness adjacent the said shelf-like portion such that if the plate slides away from the shelf-like portion thus drawing the punch off the portion, the piercing edge of the punch can strike the region of weakness and rupture the same,

and means for causing the plate to slide away from said shelf-like portion.

4,544,080

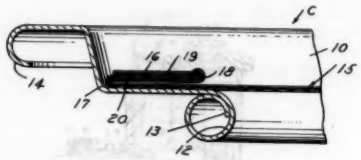
CLOSURE HAVING REINFORCED PULL TAB

Philip M. Wright, City of Industry, and Donald Didier, Chino Hills, both of Calif., assignors to General Can Company, Inc., City of Industry, Calif.

Filed Oct. 25, 1984, Ser. No. 664,767

Int. Cl.[4] B65D *41/00*

U.S. Cl. 220—359 **3 Claims**



1. A metallic closure for a container comprising

a central panel,

means forming a part of the panel for attaching the closure to the end of a container to close the end,

said panel having an opening therein,

the portion of the metal adjacent the opening being rolled so that the end thereof engages under the inner surface of the panel in a smooth roll such that the free edge is not directly exposed to the contents in the container on which the closure is placed,

and a composite panel having a layer of plastic bonded to the central panel on the inner surface of the central panel,

said composite panel including an integral radially extending tab for grasping the foil to remove it from the remainder of the closure,

said tab comprising a first portion and a second portion having the layer of plastic thereon,

said first and second portions being folded over one another with the plastic layers engaging and fusing to form a double layer tab.

4,544,081

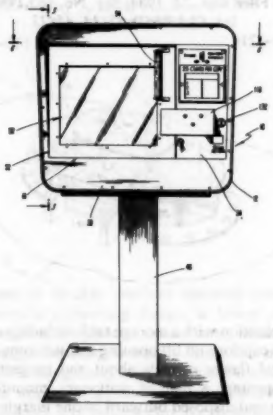
NEWSPAPER DISPLAY MACHINE

Ronald C. Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed Sep. 9, 1983, Ser. No. 530,788

Int. Cl.[4] G07F *11/04*

U.S. Cl. 221—155 **29 Claims**



1. A display machine of the type including a coin-actuated unlocking device, said display machine comprising:

a housing defining an interior compartment for containing articles to be sold, said housing forming a main access opening,

a first door movably mounted on said housing for opening and closing said access opening, said first door forming a secondary access opening,

first locking means for locking said first door to said housing,

a second door carried by said first door and being movable relative thereto for opening and closing said secondary access opening,

second locking means for locking said second door to said first door and being arranged to be unlocked in response to the insertion of appropriate coinage in said coin-actuated unlocking device, and

a key-actuated unlocking mechanism mounted on said first door and operably connected to said first and second locking means and being movable between three separate positions in response to key actuation, said unlocking mechanism including means for

maintaining said first and second locking means in their locking positions, when said unlocking mechanism is in a first of said three positions,

means for unlocking said second locking means while maintaining said locking means in its locking position, when said unlocking mechanism is in a second of said three positions, and

means for unlocking said first locking means, and maintaining said second locking means in its locking position, when said unlocking mechanism is in a third of said three positions.

4,544,082

SEPARATING AND DEPOSITING SINGLE PIECES OF GRAIN

Reinhard Becker, Oberweser, Fed. Rep. of Germany, assignor to Karl Becker GmbH & Co. KG, Oberweser, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,398

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1981, 3131620

Int. Cl.⁴ A01C *7/04*

U.S. Cl. 221—200 **8 Claims**

1. An apparatus for separating individual pieces of grain from others and depositing the separated pieces sequentially and individually, there being a funnel-shaped device having a bottom opening smaller than the smallest piece of grain, the improvement comprising:

a bracket means for temporarily enlarging the opening;

slide means, being permeable to air and provided for being temporarily disposed above the enlarged opening, in a particular level; and

means for blowing air into the interior of the funnel sufficient to cause pieces of grain to hover above said level for a closed bracket means while one grain covers the opening.

4,544,083

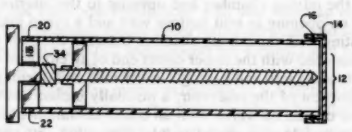
BUTTER DISPENSER

Matt Schroeder, 650 N. Kaspar, Arlington Heights, Ill. 60004

Filed Mar. 30, 1984, Ser. No. 595,403

Int. Cl.⁴ B67D *5/22, 5/42*

U.S. Cl. 222—47 **7 Claims**



1. A device for holding and dispensing butter or like material comprising:

a housing having a first and second end defined thereon, said first end arranged for discharge of the dispensed material;

sealing means for providing sealing closure of said second end of said housing and having a hole positioned therein bearing a screw thread;

a shaft of substantially the same length as said housing having a first portion bearing a screw thread of a first direction and extending substantially the full length of said shaft, and having a second portion bearing a screw thread in a second direction, and having a third portion exhibiting a smooth bearing surface, said shaft being operatively positioned within said sealing means whereby during rotation in a first direction said shaft turns on its bearing surface within said hole in said sealing means, and during rotation in said second direction said second portion of said shaft engages the threads in the hole of said sealing means and withdraws the shaft from the housing;

means affixed to said shaft proximate said third portion for providing selective rotation of said shaft; and

a piston arranged to engage the inside contour of said housing and having a threaded hole therein, and arranged for travel along said first portion of said shaft upon selective rotation of said shaft to provide dispensing pressure upon the butter.

4,544,084

BEVERAGE DISPENSER

Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720

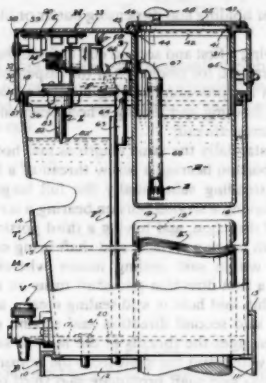
Continuation of Ser. No. 327,249, Dec. 3, 1981, abandoned. This application Jun. 22, 1984, Ser. No. 623,615

Int. Cl.⁴ B67D *1/08, 5/56*

U.S. Cl. 222—56 **8 Claims**

1. In combination, a beverage dispensing machine comprising a base engageable on a supporting structure, an upwardly opening beverage supply tank engaged atop and carried by the base and having a lower substantially horizontally base wall and vertical side walls with upper edges defining a cover engaging rim, a discharge opening at the lower end of the tank and a beverage dispensing valve connected with the discharge opening and accessible at the exterior of the machine; an automating unit to automatically mix predetermined volumes of water and beverage flavored syrup to make beverage and deliver that beverage into the tank and cyclically operable to maintain the fluid level in the tank between predetermined high and low levels, said automating unit comprises a housing with vertically spaced top and bottom walls and side walls, said bottom wall is removably positioned above the tank and has means engageable with said rim to maintain the housing positioned atop the tank, an elongate vertical upwardly opening syrup reservoir extending through said bottom wall and having a lower portion depending from that wall into the beverage in the tank and an upper portion extending up into the interior of the housing, a vertical access opening in the top wall communicates with the open top of the reservoir and a

manually movable lid normally positioned at said access opening and normally overlying the reservoir, a proportional mixing device mounted within the housing to receive and mix water and syrup and to deliver it into the tank and including an aspirator unit with an elongate mixing chamber, a water nozzle passage directing water through the mixing chamber from one end thereof, a beverage outlet communicating with the other end of the mixing chamber and opening to the interior of the tank at an opening in said bottom wall and a syrup inlet communicating with the mixing chamber between the ends thereof and connected with the upper outlet end of an elongate suction tube extending into and having a lower inlet end opening at the lower portion of the reservoir, a normally closed electrically operated on and off valve with an outlet communicating with the water nozzle passage and an inlet connected with the outlet



end of an elongate water supply line extending through and out of the housing, said water supply has an inlet end connected with a pressurized water supply, liquid level sensing means carried by the bottom wall and depending into the tank and including switching means actuated when the level of the beverage in the tank reaches said predetermined high and low levels and electric circuit means mounted within the housing and connected with and between the liquid level sensing means and the electrically operated valve and a power service cord connected with the electric circuit means and extending from the housing to a remote power service, said circuit operates to cause the valve to open when the switching means is actuated in response to the level of the beverage in the tank moving to said lower liquid level and to cause said valve to close when the switching means is actuated in response to the level of the beverage in the tank rising to said upper liquid level.

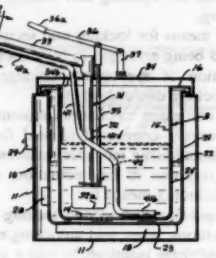
4,544,085

PUMP TYPE DISPENSER FOR HEAT SOFTENABLE FOOD PRODUCTS

John M. Frazer, Machesney Park, Ill., assignor to Taylor Freezer Company, Rockton, Ill.

Filed Jun. 22, 1983, Ser. No. 507,013
Int. Cl.⁴ B67D *5/62*
U.S. Cl. 222—146.4 **7 Claims**

1. A pump-type dispenser for heat softenable food products comprising, a product receptacle, heater means for heating the product in the receptacle and means for controlling the heater means to heat the product in the receptacle to a predetermined product softening temperature range at which the product is heat softened to a pumpable condition, pump means detachable from the receptacle and including a pump body extending downwardly in the receptacle to receive product and a dispensing spout external of the receptacle for delivering product, a closed heat pipe containing a vaporizable heat transfer fluid and having an upper condensation zone in heat exchange relation with at least a portion of the spout and a lower evaporation zone arranged to receive heat from said heater means, the type and charge of vaporizable heat transfer fluid in the closed heat pipe being selected such that, at least at the lower portion of said predetermined product softening temperature range, a portion of the heat transfer fluid is in the liquid state and a portion in the vapor state whereby, when the lower evaporization zone of the heat pipe receives heat from the heater means,



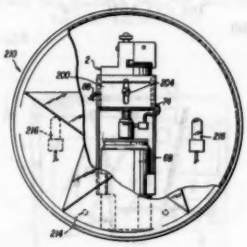
some of the liquid heat transfer fluid in the lower evaporization zone is vaporized and the vapors rise and condense in the upper condensation zone to heat the spout when the spout temperature is below temperature of the evaporization zone, the heat pipe extending downwardly inside the receptacle to position the lower evaporization zone below the product level to receive heat when the product is heated by the heater means.

4,544,086

ORNAMENT INCLUDING AUTOMATIC AND ADJUSTABLE VALVING MECHANISM

James J. Hill, Plantation, and Al Marven, Hollywood, both of Fla., assignors to Cook International, Inc., Palm Beach, Fla.

Continuation-in-part of Ser. No. 443,161, Nov. 19, 1982, Pat. No. 4,469,255. This application Apr. 15, 1983, Ser. No. 485,324
Int. Cl.⁴ B05B *7/04*
U.S. Cl. 222—649 **26 Claims**



1. An automatic and adjustable valving mechanism for the timed release of pressurized fluid from an output valve of a pressurized fluid source, said valving mechanism comprising:

a housing having an axis;

actuating means on said housing and movable into contact with said output valve in a first position for releasing pressurized fluid from said fluid source;

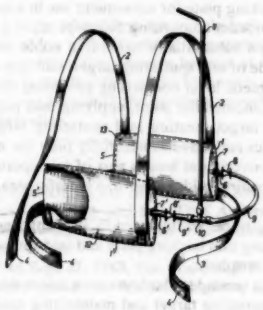
first biasing means for biasing said actuating means into said first position;

fluid pressure means in said housing for moving said actuating means from a first position to a second position wherein said actuating means and said output valve are not in contact;

means for communicating said pressurized fluid released

from said fluid source with fluid pressure means for actuating said fluid pressure means;
first adjustment means for adjusting the timing of said actuating of said fluid pressure means;
latch means on said housing for latching said actuating means in said second position;
first release means in said housing for releasing and discharging said pressurized fluid from said fluid pressure means;
second release means in said housing for releasing the latching of said actuating means by said latch means;
second adjustment means for adjusting the timing of actuation of said second release means;
support means for supporting said pressurized fluid source in a fixed position relative to said valving mechanism; and
a plastic cover to which said support means is secured and housing said valving mechanism and said pressurized fluid source.

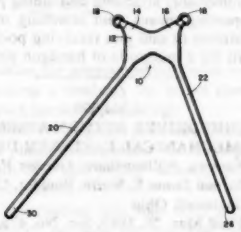
4,544,087
HOLDER FOR LIQUIDS
Ronald Modig, Odlingsvägen 17, S-138 00 Älta, Sweden
PCT No. PCT/SE82/00257, § 371 Date Apr. 12, 1983, § 102(e) Date Apr. 12, 1983, PCT Pub. No. WO83/00608, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 12, 1982, Ser. No. 491,193
Claims priority, application Sweden, Aug. 14, 1981, 8104849-8
Int. Cl.[4] A45F *3/16*
U.S. Cl. 224—148 **6 Claims**



1. Portable holder for liquids intended to be carried over the shoulders, characterized in that it comprises two exchangeable plastic bags, one on the stomach and one on the back, for the liquid, which are firmly secured to a harness which are connected by means of a tube comprising two nonreturn valves, which prevent the liquid from flowing from one bag to the other and whereby the contents of the bags are consumed simultaneously on consumption of the liquid by suction via the tube or tubes.

4,544,088
CHILD CARRYING HARNESS
Nanette L. Reding, 6528 S. Erie, Tulsa, Okla. 74136
Filed Nov. 25, 1983, Ser. No. 554,994
Int. Cl.[4] A47D *13/02*
U.S. Cl. 224—159 **2 Claims**

1. A child carrying harness having a substantially flat planar configuration and comprising:
(a) a saddle portion means operatively adapted for encasing a substantial portion of the posterior of the child to be carried on the hip of another person by passing between the legs of the child, wherein said saddle portion means is characterized, when laid out flat, as having four sides from which a pair of first and second strap means extend diagonally, angularly outwardly therefrom and from which a pair of first and second flap means extend diagonally, angularly outwardly therefrom, each strap means diagonally opposing a flap means.
(b) said first flap means operatively adapted to encircle a portion of the waist of a person carrying the child;
(c) a first strap means extending substantially in the opposite direction to said first flap means, when laid flat, and operatively adapted for surrounding the waist of a person carrying the child and engageable with said first flap means;
(d) a first fastening means cooperating between said first flap means and said first strap means for securing said first flap means to said first strap means;
(e) said second flap means extending in a direction substantially perpendicular to the direction of said first flap means and first strap means, when laid flat, and operatively adapted to pass between a leg and arm on the same side of the child to be carried;
(f) the second strap means extending substantially in the opposite direction to said flap means, when laid flat, and operatively adapted for surrounding the upper torso portion of a person carrying the child by passing over the shoulder of the person and engageable with said second flap means; and
(g) a second fastening means cooperating between said second flap means and said second strap means for securing said second flap means to said second strap means thus securing the harness to the body of the support person for



positioning the saddle portion at the side of the body of the support person for suspending the child in the hip area of the support person and in a manner permitting greater comfort and freedom of movement for the child and reducing obstruction of the front of the support person;
said first and second flap means having a first common edge along a first side of said saddle portion means, said first common edge extending in two directions from substantially the center of said first common edge substantially corresponding to the directions said first and second flap means extend, said first and second strap means having a second common edge along a second side of said saddle portion means opposite said first side, said second common edge extending in two directions from substantially the center of said second common edge substantially corresponding to the directions said first and second strap means extend, said first flap means and said second strap means having a third common edge along a third side of said saddle portion means and said second flap means and said first strap means having a fourth common edge along the fourth and remaining side of said saddle portion means, said third and fourth common edges being substantially parallel to each other between their end portions, the centers of said first and second edges being substantially closer together than the centers of said third and fourth edges.

4,544,089

ADJUSTABLE HOLSTER

William R. Tabler, 2554 Lincoln Blvd., No. 555, Marina Del Rey, Calif. 90291

Continuation of Ser. No. 441,748, Jan. 20, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,279
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—192 17 Claims

1. A holster positionable on a belt for holding a handgun, said holster comprising:

a bluing protection pad having a leathery outer surface and a woolly protective inner surface;

means for holding said pad in a position generally folded perpendicular to its longitudinal axis to create a gun receiving pocket lined by said protective inner surface;

means for supporting said bluing protection pad generally adjacent the belt, said supporting means adjustable with respect to the belt to permit a wearer to change the size, orientation and location of said gun receiving pocket; and

means for removably attaching said bluing protection pad to said supporting means, said attaching means permitting the adjustment of said gun receiving pocket to provide a custom fit for a multitude of handgun sizes and shapes.

4,544,090

ELASTOMERIC DRIVER RETURN ASSEMBLY FOR AN ELECTRO-MECHANICAL FASTENER DRIVING TOOL

Thomas E. Warman, Williamsburg; Gordon P. Baker, Amelia, both of Ohio, and James E. Smith, Boulder, Colo., assignors to Sencorp, Cincinnati, Ohio

Filed Mar. 29, 1983, Ser. No. 479,968
Int. Cl.[4] B25C *5/02, 5/06;* B25F *7/00*
U.S. Cl. 227—131 12 Claims

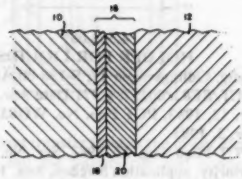
1. In combination, a driver return assembly and an electromechanical fastener driving tool of the type having a driver, an electrically driven flywheel, together with a support element to engage said driver and move said driver through a working stroke, and at least one elastomeric cord affixed at one end to said driver and at the other end to a first anchoring means within said tool to return said driver to a normal retracted position after the working stroke, said driver return assembly comprising said at least one elastomeric cord and at least two rotatable pulleys over which said elastomeric cord passes, one of said pulleys being mounted on a fixed position shaft near that end of said driver to which said cord is affixed when said driver is in said normal retracted position, the other of said pulleys being mounted on a floating shaft spaced from said fixed position shaft, a second anchoring means within said tool, at least one tension spring, said floating shaft being connected to said second anchoring means by said at least one tension spring such that said pulley on said floating shaft applies tension to said elastomeric cord automatically, compensating for permanent stretch therein and assuring that said driver returns to its normal retracted position.

4,544,091

TARGET BONDING PROCESS

Henry Hidler, Danvers; Ernest Davey, Peabody; Lawrence L. Hope, Stow, and Robert Shimer, Topsfield, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 375,625, May 6, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,159
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—124 11 Claims



1. A process for bonding a sputtering target to a heat conductive backing plate for subsequent use in a sputtering operation, said process comprising the steps of:

applying a substantially oxide-free noble metal layer over one side of said sputtering target, said step of applying the noble metal layer comprising providing the noble metal in an organometallic paint, applying said paint to said sputtering target, heating said sputtering target to drive off organics and leave substantially only the noble metal as a layer covering at least a part of said sputtering target;

applying a first solder layer to a specific area of said backing plate;

removing traces of flux used in applying said first solder;

maintaining said backing plate and said sputtering target in a dry atmosphere;

applying a second solder layer over said noble metal layer on said sputtering target and maintaining said second solder layer soft; and

heating said first solder layer on said backing plate and joining said first solder layer on said backing plate and said second solder layer on said sputtering target to form a combination solder and noble metal layer as a bond between said sputtering target and said backing plate.

4,544,092

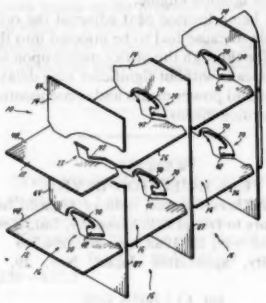
CROSS PARTITION INTERLOCK USING ENLARGED TAB

Willard Palmer, Bartlett, Ill., assignor to Rock-Tenn Company, Norcross, Ga.

Filed Sep. 10, 1984, Ser. No. 649,201
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—15 12 Claims

1. In a partition assembly having interlocking longitudinal and cross partition strips, an interlock for interlocking a longitudinal partition strip with a cross partition strip such that the strips hinge along a hinge axis at the interlock between a fully open configuration with the longitudinal and cross strips perpendicular to each other and collapsed configurations with the strips generally overlying, said interlock comprising a first slot in one of said longitudinal and cross strips which opens at an edge thereof and extends inwardly and terminates within said strip, tab retaining edges adjacent the hinge axis, said tab retaining edges generally facing each other and spaced apart along said axis, said interlock further comprising a second slot

in said other of said strips, said second slot interfitting with said first slot, and being open at an edge of said other strip and extending inwardly therefrom to terminate within said other strip, said second slot having a tab extending from a side edge of and into said slot, the tab having a base portion defined between corners at opposite ends thereof adapted to engage



the tab retaining edges of said first slot to help lock the longitudinal and cross strips in interlocking engagement, said tab further having a portion that extends beyond at least one of said base corners in the direction of the hinge axis and overlies a portion of said one strip with the partition assembly in either collapsed configuration.

4,544,093

EDGE-BONDING OF SHEET MATERIAL

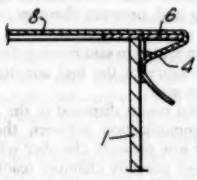
Sven O. S. Stark, Rydsgard, and Lars-Olof Andersson, Dalby, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Sep. 27, 1983, Ser. No. 536,271

Claims priority, application United Kingdom, Oct. 5, 1982, 8228403

Int. Cl.⁴ B65D *5/64, 43/00*

U.S. Cl. 229—43 **3 Claims**



1. A packaging container comprising:

a substantially tubular body formed with a wall having at least one edge;

a planar end closure panel being secured to one said at least one edge by a T-joint seal such that a zone of said closure panel projects beyond said body wall, a portion of said edge zone being separated from a remainder of said edge zone by cuts, wherein only said remainder of said edge zone is turned down by molding and bonded to the exterior of said body wall, said portion of said edge zone forming a flat lip in the plane of said closure panel;

an outlet aperture in said end closure panel;

a tear away tab attached to said end closure panel and covering said outlet aperture, said tear away tab being aligned with said portion of said edge zone forming said lip, said tear away tab having a portion projecting beyond said lip and being folded over said lip and attached to said exterior of said body wall.

4,544,094

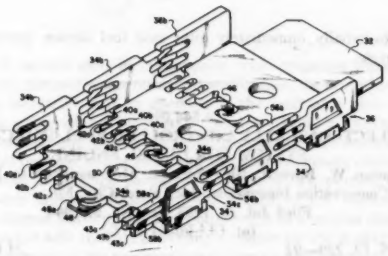
MEANS FOR JOINING TOY TRACK SECTIONS

Michael F. Scholey, Hollywood, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 19, 1983, Ser. No. 533,314

Int. Cl.⁴ A63H *18/02*; E01B *23/00*

U.S. Cl. 238—10 R **13 Claims**



1. A track section for interconnection with other like track sections for forming a roadway for travel thereover of toy vehicles, said track section comprising:

a unitary member formed of a generally flexible material in a generally planar arrangement and having a main body portion with first and second sidewall portions on the lateral edges thereof;

hinge means intermediate said main body portion and each of said sidewall portions for enabling pivoting of said sidewall portions into opposing relation to a position generally transverse to said main body portion;

interlock means on said main body portion and each of said sidewall portions for maintaining said sidewall portions in the generally transverse position; and

means for coupling said track section to another track section having coacting coupling means for forming a roadway.

4,544,095

METHOD FOR ATOMIZATION AND DEVICE FOR CARRYING OUT THE METHOD

Karl-Axel Litzén, Bromma, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Mar. 21, 1983, Ser. No. 477,134

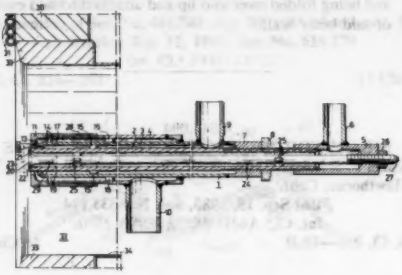
Claims priority, application Sweden, Mar. 31, 1982, 8202066

Int. Cl.⁴ B05B *7/06*

U.S. Cl. 239—8 **5 Claims**

1. A method for atomizing coal-water slurry or coal-oil slurry fuel, the fuel being brought together with a gas under pressure in an atomizing nozzle, which comprises passing a continuous stream of fuel through a channel of circular cross-section, and accelerating and preliminarily disintegrating said fuel flow at a location adjacent the outlet end of the nozzle by means of at least one first stream of gas under pressure directed inwardly against the outside of the stream of fuel, and by finally atomizing said fuel by directing at least one second

stream of gas under pressure outwardly against the inside of the accelerated and preliminarily disintegrated fuel stream,



substantially immediately after said fuel stream leaves said nozzle.

4,544,096

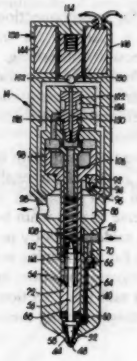
ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR DIESEL ENGINE

Lauren W. Burnett, Blue Springs, Mo., assignor to Energy Conservation Innovations, Inc., Bates City, Mo.

Filed Jul. 28, 1983, Ser. No. 517,944

Int. Cl.[4] F02M *47/02*

U.S. Cl. 239—92 **21 Claims**



1. In a fuel injector,

a tubular body having a fuel inlet port for receiving a constant supply of pressurized fuel and a fuel exhaust port, each disposed intermediate the ends of the body;

a fuel injection nozzle secured to the body at one of said ends and having fuel atomizing orifice means;

valve means reciprocable in the body along the longitudinal axis of the body toward and away from the orifice means and normally closing the latter;

means presenting a fuel pressure amplification chamber in the body adjacent the nozzle and communicating directly therewith;

a fuel pressure amplifying plunger extending from the chamber toward the opposite of said ends and reciprocable in the body along said axis toward and away from the orifice means;

blocking means normally precluding flow of fuel from the inlet port to the exhaust port;

selectively operable power means associated with said body, said blocking means being releasable upon actuation of the power means; and

structure in the body operable upon said actuation of the power means for forcing the valve away from the orifice means to open the latter and forcing the plunger toward the orifice means in response to the pressure of fuel in the body whereby to amplify the fuel pressure in the chamber and to spray the pressure amplified, atomized fuel emanating from the orifice means into a cylinder of an internal compression ignition engine,

said chamber being located next adjacent the orifice means in the nozzle to cause fuel to be injected into the cylinder of said engine through the orifice means upon actuation of the power means without significant time delay following actuation of said power means and consequential unblocking of the orifice means.

4,544,097

FUEL INJECTION DEVICE

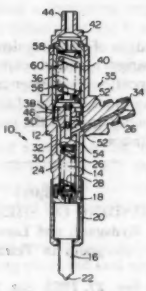
Fujio Aoki, and Kazumi Koike, both of Higashi Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,746

Claims priority, application Japan, Nov. 29, 1982, 57-180359[U]

Int. Cl.[4] B05B *9/00*

U.S. Cl. 239—126 **3 Claims**



1. A fuel injection device for maintaining an injection pressure of fuel supplied from a source of fuel supply within a predetermined range, comprising:

a housing having a low pressure chamber communicating to the outside and a high pressure chamber receiving the supplied fuel;

an injection valve mounted in said housing for injecting fuel in response to a pressure of the fuel admitted into the high pressure chamber; and

injection rate control means disposed in the housing for providing fluid communication between the high pressure chamber and the low pressure chamber when a pressure of the fuel in the high pressure chamber reaches a first predetermined value, thereby delivering the fuel into the low pressure chamber, the injection rate control means comprising control valve means for controlling the communication between the high pressure chamber and the low pressure chamber in response to a pressure of the fuel in the high pressure chamber;

the control valve means comprising a valve box formed with a cylindrical through bore communicating to the high pressure chamber and passageway means for communicating said bore to the low pressure chamber, a valve member slidably received in said bore for controlling the communication between the bore and the passageway means in response to a pressure of the fuel, and biasing means for biasing said valve member in a direction for blocking communication between the bore and the passageway means, the biasing

means comprising a spring one end portion of which is engaged with one end portion of the valve member;

the spring having a spring constant which is selected to press one end portion of the valve member to provide communication between the bore and the passageway means when the fuel pressure in the high pressure chamber reaches the first predetermined value;

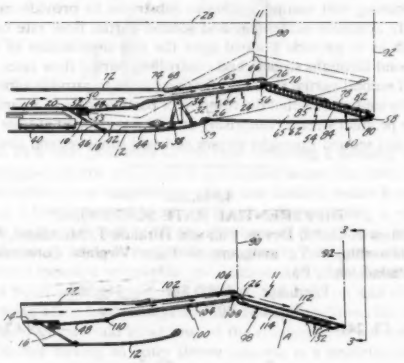
the valve member and spring being constructed to progressively increase communication between the bore and the passageway means as the pressure rises from the first predetermined value to a second predetermined value and provide full communication between the bore and the passageway means at pressures above the second predetermined value.

4,544,098

COOLED EXHAUST NOZZLE FLAPS

Robert E. Warburton, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,186
Int. Cl.⁴ B64C *15/06*
U.S. Cl. 239—127.3 **10 Claims**



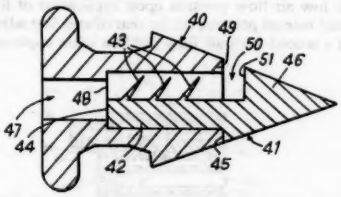
1. A variable area axisymmetric exhaust nozzle having an axis, a throat, and an exit, and comprising a plurality of movable first flaps circumferentially disposed about said axis defining a diverging nozzle, each flap having an upstream end substantially at said throat and a downstream end substantially at said exit, at least every other one of said flaps being a cooled flap, said cooled flaps each including an inner wall forming a portion of a gas flow path through said nozzle and an outer wall disposed radially outwardly of said inner wall, said outer wall having a forward and rearward end portion, each of said cooled flaps having a cooling fluid channel defined between said inner and outer wall, said channel extending over substantially the full length of said cooled flap and having a forward end and rearward end, said inner wall of each of said cooled flaps having at least one first opening therethrough into said forward end of said channel at or immediately downstream of said throat, and said outer wall of each of said cooled flaps having at least one second opening through said rearward end portion thereof communicating with said rearward end of said channel, said second opening adapted to communicate with a supply of cooling fluid at a pressure greater than the fluid pressure in the gas flow path at said first opening under at least some nozzle operating conditions to cause said cooling fluid to enter said channel via said second opening and to exit said channel into said gas flow path via said first opening thereby convectively cooling said inner wall over substantially its entire length.

4,544,099

FLOW CONTROL VALVE

Harold R. Norris, 6, Elstree Way, Borehamwood, Hertfordshire, England WD6 1SB

Continuation of Ser. No. 255,988, Apr. 20, 1981, abandoned. This application Nov. 9, 1983, Ser. No. 532,535
Int. Cl.⁴ B05B *1/30*
U.S. Cl. 239—271 **1 Claim**



1. A nozzle used in conjunction with irrigation pipes to provide directed water release from the pipes, the nozzle being easily insertable into an aperture in the wall of a pipe, the nozzle comprising a main body member having a truncated, cone-shaped end portion, a reduced diameter mid portion, a flanged opposite end portion, and an axial passageway of circular cross-section, the passageway having a first portion of a diameter uniform throughout the length of the truncated, cone-shaped portion, and a second portion of a smaller diameter coaxial with the first providing an outlet for the nozzle, the meeting point of the two portions defining an annular step, and a valve device insertable into the first portion of the axial passageway, the valve device having a semicylindrically shaped stem portion and a conically shaped opposite end portion, the stem portion being inserted into the first portion of the axial passageway until the end of the stem abuts the annular step formed in the passageway and the conically shaped portion abuts the truncated, cone-shaped portion of the body, the semicylindrical stem extending beyond the end of the main body to define a gap between the main body and the cone-shaped portion of the valve device so as to provide a water inlet, and flexible vanes extending radially outwardly from the stem portion of the valve device into the direction of fluid flow, the vanes having a semicircular cross-section which corresponds to the inner surface of the passageway and deflect under increased fluid pressure to approach the inner surface of the passageway thereby restricting fluid flow therethrough.

4,544,100

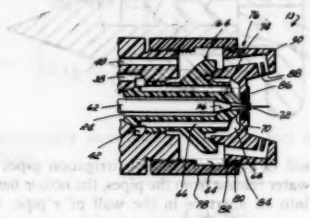
LIQUID SPRAY GUN HAVING QUICK CHANGE PATTERN CONTROL

Richard M. Simashkevich, Lorain, and William J. Sharp, Wakeman, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 6, 1983, Ser. No. 539,658
Int. Cl.⁴ B05B *7/12*
U.S. Cl. 239—407 **17 Claims**

1. A spray gun having a quick change pattern control valve assembly mounted thereon for varying the patterns of liquid emitted from said gun, said gun including a gun body, an air passage in said gun body, said pattern control valve assembly comprising a valve seat within the forward end of said passage, a valve mounted for axial movement toward and away from said seat, a tubular hollow casing, said casing having exterior threads threadedly engaged with interior threads located adjacent the rearward end of said passage, a shank integral with said valve and extending rearwardly through said hollow casing, a rotational driving connection between said shank and said casing, said connection permitting relative axial sliding motion between said shank and said casing, a threaded end on said shank projecting rearwardly of said casing, a first adjusting means fixedly secured onto the rearward end of said shank

and a second adjusting means threadedly secured over the threaded end of said shank, an annular shoulder means on said shank facing rearwardly away from said valve seat, a first annular forwardly facing shoulder means on said casing engageable with said annular shoulder means on said shank, a second rearwardly facing shoulder means on said casing, forwardly facing shoulder means on said second adjusting means engageable with said second shoulder means on said casing, said pattern control valve assembly being movable between a first low air flow position upon application of forwardly directed manual pressure on the rear of said first adjusting means and a second high air flow position upon application of rearwardly directed manual pressure to said first adjusting means, said forwardly directed manual pressure being operable to move said valve forwardly toward said valve seat until said forwardly facing shoulder of said second adjusting means engages said second rearwardly facing shoulder means on said casing to establish the first forwardmost adjusted position of said valve relative to said valve seat and said rearwardly directed manual pressure on said first adjusting means being operable to move said valve rearwardly away from said valve seat until said rearwardly facing shoulder means on said shank engages said first forwardly facing shoulder means on said casing to establish the second rearwardmost adjusted position of said valve to said valve seat.



4,544,101

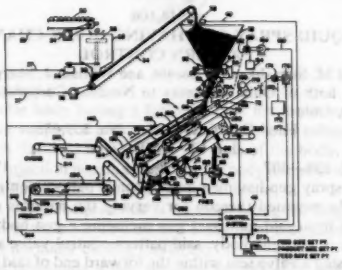
DIFFERENTIAL RATE SCREENING

William F. Hahn, Devon, Pa.; Hiramie T. McAdams, Williamsville, and Robert L. Talley, Marilla, both of N.Y., assignors to Penn Virginia Corporation, Philadelphia, Pa.

Filed Apr. 9, 1982, Ser. No. 366,961

Int. Cl.[4] B02C *23/14, 23/16*

U.S. Cl. 241—24 **94 Claims**



1. A differential rate screening process for continuously screening a feed of particulate material to provide a product having a preselected size distribution substantially different from a predetermined size distribution of said feed which contains particles distributed among a plurality of substreams each of a different size class, said screening process comprising introducing a first stream of said feed onto a first screening member of a screen means, said first screening member having apertures of sufficient size to pass at least two substreams of said feed stream as first undersize substreams; separating said feed stream into at least a first throughs stream and one other first stream by causing part of each of said first undersize substreams to pass through the apertures of said first screening member and into said first throughs stream at first partial flow rates substantially greater than zero and substantially less than conventional flow rates at which said first undersize substreams would pass through the apertures of said first screening member upon screening said first undersize substreams to provide essentially complete screening, said first partial flow rates being such as to provide control over the size distribution of said first throughs stream; introducing onto a second screening member of said screen means at least one input stream comprising at least a portion of at least one of said first throughs stream and said other first stream, said second screening member having apertures of sufficient size to pass at least one substream of said input stream as a second undersize substream; separating said input stream into at least a second throughs stream and one other second stream by causing part of said second undersize substream to pass through the apertures of said second screening member and into said second throughs stream at a second partial flow rate substantially greater than zero and substantially less than conventional flow rates at which said second undersize substream would pass through the apertures of said second screening member upon screening said second undersize substream to provide essentially complete screening, said second partial flow rate being such as to provide control over the size distribution of said second throughs stream; and controlling partial flow rates and said second partial flow said first rate so as to provide substantially said preselected distribution of particle sizes in a particulate product stream comprising at least a portion of at least one of said second throughs stream and said other second stream.

4,544,102

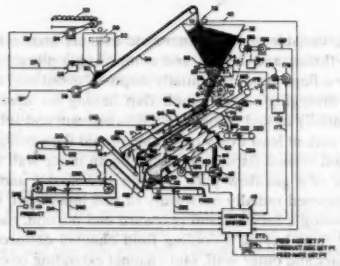
DIFFERENTIAL RATE SCREENING

William F. Hahn, Devon, Pa., and Hiramie T. McAdams, Williamsville, N.Y., assignors to Penn Virginia Corporation, Philadelphia, Pa.

Filed Apr. 9, 1982, Ser. No. 366,965

Int. Cl.[4] B02C *23/14, 23/16*

U.S. Cl. 241—24 **79 Claims**



1. A differential rate screening process for continuously screening a feed of particulate material to provide a product having a preselected size distribution substantially different from a predetermined size distribution of said feed which contains particles distributed among a plurality of substreams each of a different size class, said screening process comprising introducing a stream of said feed onto a screening member of a screen means, said screening member having apertures of sufficient size to pass at least one of said substreams as an undersize substream; separating said feed stream into at least a first throughs stream and one other first stream by causing part of said undersize substream to pass through the apertures of said screening member and into said first throughs stream at a first partial flow rate substantially greater than zero and substantially less than conventional flow rates at which said un-

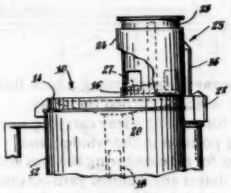
dersize substream would pass through the apertures of said screening member upon screening said undersize substream to provide essentially complete screening, said first partial flow rate being such as to provide control over the size distribution of said first throughs stream; and controlling said first partial flow rate so as to provide substantially said preselected size distribution in a particulate product stream comprising at least a portion of at least one of said first throughs stream and said other first stream.

4,544,103

ENLARGED FOOD PUSHER WITH CLEAN-OUT WINDOWS IN A FEEDTUBE PROTECTOR

John W. Breeden, Westport, Conn., assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Mar. 5, 1984, Ser. No. 586,237
Int. Cl.⁴ B02C *25/00*
U.S. Cl. 241—37.5 **4 Claims**



1. In a food processor of the type including a housing containing an electric motor drive and control means for rendering said motor drive inoperative unless said control means is actuated, a bowl mountable on said housing for enclosing a rotatable tool within said bowl drivable by tool drive means when said motor drive is rendered operative by actuation of said control means, a removable cover adapted to be positioned on said bowl with an expanded feedtube mounted on said cover forming a first food passageway for feeding food items through said cover into said bowl toward the rotating tool, a feedtube protector having an outer sleeve nestable in a predetermined position around the exterior of said feedtube, a captured food pusher of oblong cross-sectional configuration being captured in telescoping relationship with respect to said outer sleeve for enabling said captured food pusher to move longitudinally within said outer sleeve, said captured food pusher being in alignment with the interior of said outer sleeve for causing said captured food pusher to become aligned with said first food passageway and plungable therein only when said outer sleeve is nested around said feedtube, said captured food pusher having a bottom surface enclosing one end of said captured food pusher which end comes into contact with the food items being fed into said bowl, a second food passageway formed by a circular-shaped tubular member extending through said captured food pusher defining crescent-shaped cavities having cusp regions within said captured food pusher, an improved feedtube protector structure comprising:

at least one clean-out port in a side wall of said captured food pusher communicating with said cusp region of each crescent-shaped cavity adjacent the bottom of said captured food pusher, and

at least one drain port extending horizontally around the periphery of said bottom of said captured food pusher communicating with said cusp region of each of said crescent-shaped cavities,

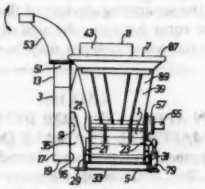
said clean-out port and said drain port being joined with said clean-out port extending vertically above said drain port thereby providing a means for cleaning the interior of said captured food pusher.

4,544,104

WOOD CHIPPER

Jan E. K. Carlsson, Vittaryd, Sweden, assignor to KMW ERJO AB, Lagan, Sweden

Filed Dec. 16, 1983, Ser. No. 562,455
Int. Cl.⁴ B02C *23/00*
U.S. Cl. 241—57 **17 Claims**



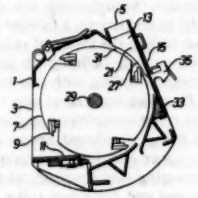
1. A wood chipper comprising a chipper rotor housing supported by a frame, and a chipper rotor rotatably journaled therein, said chipper rotor housing having inlet means for feeding material intended for chipping into the chipper rotor and outlet means for discharging wood chips produced by the chipper rotor, said chipper rotor housing and said frame including cooperating bearing means in the form of cooperating, arc-shaped support and guide means having radii that have a common center in the axis of rotation of the chipper rotor, the chipper rotor housing being, by means of said bearing means, pivotally arranged on the frame for pivoting around the axis of rotation of the chipper rotor and setting of said inlet means in different operating positions for adaptation to different operating conditions.

4,544,105

SEPARATING DEVICE FOR A WOOD CHIPPER

Jan E. K. Carlsson, Vittaryd, Sweden, assignor to KMW ERJO AB, Lagan, Sweden

Filed Dec. 16, 1983, Ser. No. 562,454
Int. Cl.⁴ B02C *23/00*
U.S. Cl. 241—73 **4 Claims**



1. A wood chipper comprising a chipper rotor housing, a chipper rotor rotatably journaled in said rotor housing, said chipper rotor housing having inlet means for feeding material intended for chipping to the chipper rotor and outlet means for discharging wood chips produced by the chipper rotor, and having an opening located before said outlet means and being adapted for receiving a separating device for separating from a flow of wood chips, pieces of material which are larger than a predetermined maximum size for discharged chips, and said wood chipper including a set of externally identical separating devices, a selected one of the separating devices of said set being positioned in and closing said opening in the rotor housing, and wherein each of the separating devices of said set comprise a supporting means and a plurality of oblong, substantially parallel, uniform ribs attached to said supporting means, said ribs defining between themselves spaces through which chips of said maximum size and less may pass to said outlet means, each of said ribs having a portion with an arc-shaped edge facing said chipper rotor, the radius of said edge

having its center substantially coincident with the axis of rotation of said chipper rotor, said arc-shaped edge being arranged at a predetermined distance from the cylindrical surface of said chipper rotor in order to form a free passage therebetween for pieces of material which are larger than the desired maximum size of discharged chips, and wherein the respective separating devices of said set have different numbers of ribs and thereby different spacing between the ribs so that by inserting a selected one of the separating devices of the set into said opening in the chipper rotor housing, the size of the wood chips discharged from the wood chipper may be controlled.

4,544,106

SUCTION APPARATUS FOR REMOVING FIBER MATERIAL IN A BALE OPENER

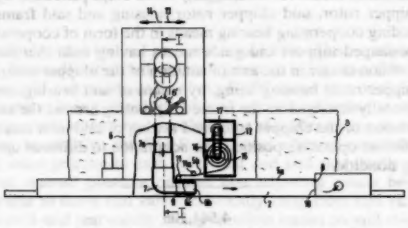
Dietmar Hackenbeck, Viersen, and Hans-Jürgen Marx, Jüchen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. Kg, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,348

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228343; Jun. 16, 1983, 3321802

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—101 A **18 Claims**



1. In a fiber bale opener including a truck arranged for back-and-forth movement along a traveling path, an opening mechanism carried by said truck for removing fiber material from fiber bales and a suction apparatus including a stationary suction duct having a length extending in the direction of said traveling path and a throughgoing slot on one side thereof, extending parallel to said length, a flexible cover belt extending over said slot for sealing the inside of said duct from the environment, said cover belt defining an interstice within said truck; said interstice traveling with said truck and providing a passage for the fiber-like material to pass inside of said suction duct; a deflection roller mounted on said truck at the interstice; said cover belt being positioned above said slot and being divided into an upper and lower section or layer with said lower section covering said longitudinal slot; said cover belt being guided around said deflection roller and having one end fixed at one end of said traveling path; the improvement comprising a winding and unwinding device situated at a distance from said deflection roller in a direction of the traveling path; said device including a rod-like core around which said cover belt can be wound; said upper section of said cover belt extending from said deflection roller to said device and being connected to said core.

4,544,107

COP DELIVERY SYSTEM

Isamu Matsui; Yoshio Yamamoto; Kazuo Nakanishi; Masaharu Kiriake, and Akira Shimamoto, all of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Sep. 23, 1982, Ser. No. 421,810

Claims priority, application Japan, Sep. 25, 1981, 56-152361

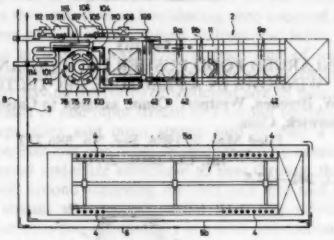
Int. Cl.⁴ B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **6 Claims**

1. A cop delivery system for automatically delivering cops from a spinning frame to a winder and empty bobbins from the winder to the spinning frame, the winder having an entrance and an exit opening, the system comprising:

a cop delivery conveyor connecting a spinning frame to a winder and forming a closed loop therebetween, said delivery conveyor including a discharge conveyor for moving empty bobbins to the spinning frame and a supply conveyor for moving cops to the winder;

a plurality of trays, each having a cop carried independently thereon, said trays being arranged on the delivery conveyor to convey cops;



pick finding means for performing a pick finding operation on each cop which is carried on a tray;

transfer means for moving a tray carrying a cop into and out of a winding position in the winder; and

detection means for (a) monitoring bobbins after the winding operation to detect any residual yarn-retaining bobbin and (b) delivering each bobbin to either the supply conveyor or the discharge conveyor as a function of the monitoring operation.

4,544,108

METHOD FOR WINDING A THREAD ON A BOBBIN AND ELECTRO-HYDRAULIC TRAVERSE MOTION DEVICE FOR CARRYING OUT THE METHOD

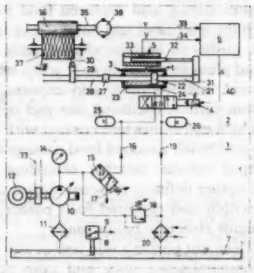
Martin Maurer, Uttwil, Switzerland, assignor to Hydrel Ag, Romanshorn, Switzerland

Filed Oct. 1, 1984, Ser. No. 656,613

Claims priority, application Switzerland, Sep. 30, 1983, 5330/83

Int. Cl.⁴ B65H *54/28, 54/32, 54/38*

U.S. Cl. 242—43 R **13 Claims**



1. A method for winding a yarn or thread on a cylindrical or conical bobbin, comprising:

rotating a shaft operatively coupled to the bobbin;

reciprocating a hydraulically controlled traverse member having at least one thread guide thereon for feeding the yarn to the rotating bobbin;

generating an electrical guide signal in response to and proportional to the speed of the shaft;

generating a position signal depending on the position of a

hydraulic piston means coupled to the traverse member for driving the traverse member;

setting monitoring switch means coupled to an electronic control means for controlling piston speed and piston stroke in response to the guide signal and position signal; and

applying the guide signal and position signal to the electronic control means for generating a signal applied to the hydraulic means for regulating the piston speed and piston stroke.

4,544,109

ROLL STANDS FOR SIMPLE ROLL REPLACEMENT

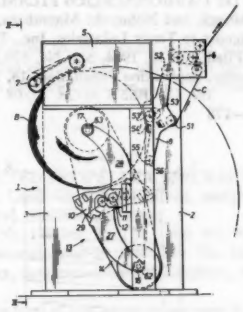
Bengt A. Andreásson, Åmål, Sweden, assignor to Aktiebolaget Amals Mekaniska Verkstad, Åmål, Sweden

Filed May 15, 1984, Ser. No. 610,573

Claims priority, application Sweden, May 18, 1983, 8302792

Int. Cl.⁴ B65H *19/08, 19/18*

U.S. Cl. 242—58.1 **10 Claims**



1. A roll stand for rolls of sheet material wound on bobbins, each bobbin having an axis and an axial hollow core, allowing exchange of a bobbin in a first position, having a full roll of sheet material wound thereon with an empty bobbin in a second position, said roll stand comprising roll holder means, having an axis of rotation, for supporting a bobbin having a full roll of sheet material wound thereon in a first position and supporting an empty bobbin in a second position, said roller holder means rotatable about said axis of rotation to exchange said bobbin having a full roll of sheet materlal in said first position with said empty bobbin in said second position; and machine frame means for supporting said roll holder means for rotation about said axis of rotation; wherein said roll holder means comprises:

a horizontal center shaft having an axis, said center shaft journalled in bearings in said machine frame means for rotation about said center shaft axis;

a first gable and a second gable, said first and second gables being horizontally spaced apart and connected to said horizontal center shaft for rotation therewith;

at least two spaced apart horizontal roll spindles, each roll spindle having an axis parallel to said center shaft axis and being rotatable about said axis, each spindle having a first end and a second end, said first ends rotatably supported by said first gable and said second ends rotatably supported by said second gable, each of said spindles cocoaxially receivable within the axial hollow core of a respective bobbin, said bobbins rotatable together with said respective spindles;

said first gable rigidly connected to said center shaft, said first ends of said spindles stiffly journalled in said first gable;

said second gable comprising at least two supporting arms, each supporting arm having an inner end and an outer end, said outer end provided with a support bearing detachably connected to said second end of a respective spindle for supporting said second end, said supporting arms being individually movable between a first arm position, wherein said support bearing is connected to said second end of a respective spindle for support thereof, and a second arm position, wherein said support bearing is detached from said second end of the respective spindle and said arm is moved aside so as to not interfere with the axial movement of a bobbin having a full roll of sheet material wound thereon when said bobbin is coaxially aligned with said respective spindle; and

activating means for moving said arms individually between said first position and said second position.

4,544,110

APPARATUS FOR INTRODUCING STRIP-SHAPED MATERIAL INTO CASSETTES OR THE LIKE

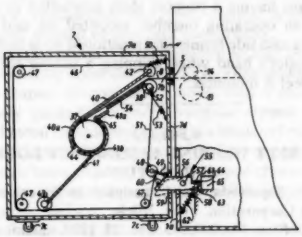
Erich Nagel, Anzing; Leonhard Huber, Glonn, and Günter Lammel, Eching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,889

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151956

Int. Cl.⁴ G03B *27/58*

U.S. Cl. 242—67.1 R **27 Claims**



1. Apparatus for transporting a web, particularly a web of photosensitive material, from a copying machine into a receptacle having a rotary component; and a catcher mechanism activatable to direct the leader of the web into engagement with the rotary component, comprising a signal-responsive operating device associated with the copying machine and arranged to assume first and second conditions in which said device respectively activates and deactivates the catcher mechanism, said operating device comprising a projection provided on the copying machine and movable between first and second positions in which said operating device respectively assumes said first and second conditions, the receptacle being movable to and from a predetermined position in which said operating device activates the catcher mechanism as long as said operating device remains in said first condition; and means for changing the condition of said operating device to thus initiate deactivation of the catcher mechanism, comprising means for scanning the progress of engagement between the web and the rotary component, and for transmitting signals to said device in response to completion of engagement between the web and the rotary component.

4,544,111

BRAKE FOR A FISHING REEL

Hideki Nakajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 28, 1983, Ser. No. 470,338

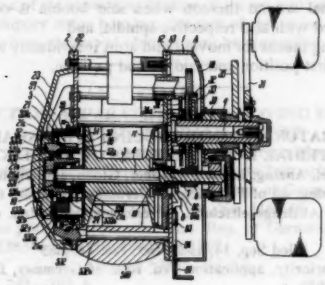
Claims priority, application Japan, Mar. 9, 1982, 57-37470; Mar. 9, 1982, 57-37471

Int. Cl.⁴ A01K *89/02*

U.S. Cl. 242—84.52 B **4 Claims**

1. A fishing reel comprising: a reel body supporting a spool

rotatably, said reel body having a pair of side frames; a drive mechanism supported to said reel body and having a clutch for releasably driving said spool; a magnet brake having a cylindrically-shaped electric conductor rotatable together with said spool, a magnet holder having at least one magnet opposite to said conductor, and adjuster means which moves said magnet, said adjuster means comprising means for moving said magnet



holder radially relative to said conductor to adjust a gap in a radial direction between said magnet and said conductor, said adjuster means having a support shaft journalled to said side frames and an operating member mounted on said support shaft between said side frames and positioned so as to be operable by an angler's hand when gripping a fishing reel rod on which said reel is mounted.

4,544,112

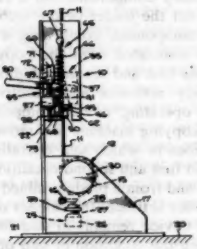
SAFETY BELT WEBBING EMERGENCY LOCKING APPARATUS

Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

Continuation of Ser. No. 227,275, Jan. 22, 1981, abandoned. This application Mar. 9, 1984, Ser. No. 579,983

Int. Cl.⁴ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.2 **8 Claims**



1. A safety belt webbing emergency locking apparatus comprising:

clamping means for selectively clamping safety belt webbing against further movement relative to the clamping means, said clamping means including a wedge shaped clamp member moveably disposed between a vertical subtment surface and an inclined surface spaced from said vertical abutment surface with said webbing passing between said clamp member and said vertical abutment surface;

support means for underlying said clamp member and normally supporting it in a webbing disengaging position;

biasing means connected to said support means for normally biasing said support means underlying said clamp member to move vertically and drive said wedge shaped clamp member against said inclined surface to cause it to clamp said webbing against said abutment surface in a webbing clamping position;

releasable retaining means connected to said support means and normally holding said support means against the bias of said biasing means with said clamp member in said webbing disengaging position; and

inertia responsive means for operating said releasable retaining means independently of webbing movement to release said support means in response to vehicle acceleration or deceleration, of more than a predetermined amount in any generally horizontal direction whereby the bias of said biasing means is allowed to bias said support means vertically to drive said wedge shaped clamp member vertically against said inclined surface to clamp said webbing against said abutment surface and thereby prevent said further relative movement of said webbing relative said locking apparatus.

4,544,113

PACKAGE OF CARBONACEOUS FILAMENT STRAND

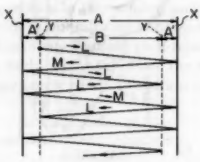
Minoru Yoshinaga, and Nobuyuki Matsubara, both of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 12, 1984, Ser. No. 570,211

Claims priority, application Japan, Jan. 18, 1983, 58-6068

Int. Cl.⁴ B65H *54/28, 55/04*

U.S. Cl. 242—178 **6 Claims**



1. A package of a continuous carbonaceous filament strand wound in reversing layers of helical coils on a bobbin to form a square-end cheese, wherein the coils are laid down by traversing strokes of two unequal lengths to form a plurality of longer coil layers and a plurality of shorter coil layers, the difference between the lengths of the longer and the shorter coil layers being in the range of from 2% to 20% of the length of the longer coil layers, and the longer coil layers being the same length as the package, and the coil layers are laid down by reversing traverse strokes in a repeated pattern consisting of, in order, a longer coil layer, a shorter coil layer, and a second shorter coil layer.

4,544,114

FISHING REEL WITH ANTIREVERSE AND DIRECT DRIVE FEATURES

Norman L. Stauffer, 7177 S. Ulster St., Englewood, Colo. 80112

Continuation of Ser. No. 503,664, Jun. 13, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 704,146

Int. Cl.⁴ A01K *89/02*

U.S. Cl. 242—213 **8 Claims**

1. A fishing reel comprising:

a reel frame;

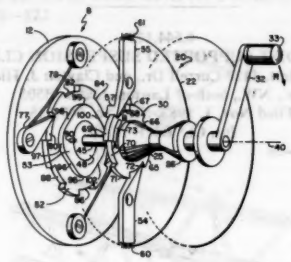
a spool for collecting and storing line;

rotation means including a first ratchet wheel attached to and driven by said rotation means;

a second ratchet wheel mounted so as to rotate with the first ratchet wheel after limited relative rotation, the second ratchet wheel engaging a first pawl to allow rotation in only one direction;

a second pawl carried on the spool and having a pliant portion in contact with the reel frame which biases the position of the second pawl, in response to the direction of rotation of the spool so that when the spool rotates in a

direction to collect line the second pawl comes into contact with the first ratchet wheel to allow positive drive of the spool from the rotation means, and when the spool rotates in a direction to allow line removal, the second pawl is biased to a position which precludes engagement with the first ratchet wheel; and



a cam surface fixed to the second ratchet wheel to cause disengagement of the second pawl from the first ratchet wheel when the spool rotation is in a direction to remove line.

4,544,115

DUCTED PROPELLER AIRCRAFT

John K. Edgley, Cambridgeshire, England, assignor to Edgley Aircraft Limited, Salisbury, England

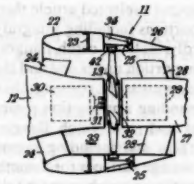
Division of Ser. No. 145,341, Apr. 30, 1980, Pat. No. 4,371,133. This application Sep. 30, 1982, Ser. No. 430,509

Claims priority, application United Kingdom, May 1, 1979, 7915156

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.⁴ B64D *27/02*; B64C *3/32*

U.S. Cl. 244—54 **11 Claims**



1. An aircraft having lift-producing means comprising a mainplane, a prime mover, and a propeller with a hub operatively driven by the prime mover in use to produce by movement through the ambient air sufficient thrust for flight of the aircraft, the propeller being located intermediate the port and starboard ends of the mainplane comprising:

(i) an annular shroud including a mainplane support portion, said shroud including a trailing portion within which the propeller rotates;

(ii) said propeller being mounted to the prime mover, and the prime mover being fixedly mounted to the trailing portion of the shroud, so that the propeller is held substantially fixed against transverse movement relative to the longitudinal axis of the trailing portion of the shroud; and

(iii) said trailing portion of the shroud being mounted to the mainplane support portion of the shroud by resilient mounting blocks which serve to isolate vibrations of the prime mover in directions transverse to the longitudinal axis of the aircraft in the trailing portion from the mainplane support portion of the shroud.

4,544,116

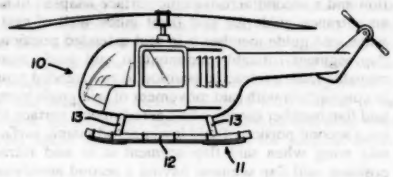
HELICOPTER LANDING SKID SHOE PAD

Warren M. Shwayder, 2335 E. Lincoln, Birmingham, Mich. 48008

Filed Nov. 14, 1983, Ser. No. 550,778

Int. Cl.⁴ B64C *25/52*

U.S. Cl. 244—108 **6 Claims**



1. For use with a helicopter landing skid which is formed of a horizontally elongated tube arranged beneath and secured to the helicopter so that the skid engages and supports the helicopter upon the ground, the skid including an elongated upwardly opening first channel secured to the underside of the tube, the improvement of a plurality of shoe pads, each comprising:

a narrow, horizontally elongated, shallow depth, U-shaped channel formed of thin, stiff sheet metal;

the U-shaped channel being inverted so that its legs extend downwardly from its base and it opens downwardly;

the U-shaped channel being filled with a solid matrix of closely packed, generally irregular shaped particles of hard metal carbide embedded in a binder of relatively soft, ductile, somewhat resilient, high heat conductive metal;

the matrix being exposed at the U-shaped channel opening to form an elongated, substantially flat, narrow, ground-engaging surface;

means for fastening the base of the U-shaped channel to the bottom of the first channel of the skid so that the U-shaped channel extends along a substantial portion of the skid;

whereby the pad materially reduces skid damage and skid wear due to frictional contact between the skid and ground or runway, and the matrix tends to absorb ground impacts and to reduce the ground contact friction and to dissipate friction caused by heat.

4,544,117

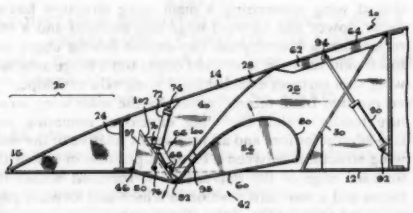
LEADING EDGE FLAP AND BOUNDARY LAYER CONTROL SYSTEM

John H. Schuster, Lancaster, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Nov. 14, 1983, Ser. No. 550,860

Int. Cl.⁴ B64C *9/26*

U.S. Cl. 244—210 **6 Claims**



1. A leading edge flap and boundary layer control system for an aircraft wing having a substantially sharp leading edge, said system comprising:

said wing having a spanwise slot having front and rear guide walls, said slot located a discrete distance from said leading edge extending from the lower aerodynamic surface to the upper aerodynamic surface of said wing;

a guide member rotatably mounted to said wing movable from a retracted position to an extended position, said guide member having a first aerodynamic surface defining and acting as a first portion of said lower aerodynamic surface when said guide member is in said retracted position and a second aerodynamic surface adapted to act as an entrance guide for said front guide wall of said slot when said guide member is in said extended position;

a flap segment rotatably mounted to said guide member movable from a retracted position to an extended position in conjunction with said movement of said guide member, said flap member having a first aerodynamic surface forming a second portion of said lower aerodynamic surface of said wing when said flap segment is in said retracted position, said flap segment having a second aerodynamic surface adapted to form an aerodynamic extension of said leading edge and cooperating with said second aerodynamic surface of said guide member to form a smooth transition inlet to said slot when in said extended position;

first actuation means adapted to move said guide member and said flap segment from said retracted positions to said extended positions;

a door member rotatably mounted to said wing adapted to rotate from an extended position to a retracted position, said door member having an upper surface adapted to form a portion of said upper aerodynamic surface of said wing when in said extended position, and to form a portion of said rear wall of said slot when in said retracted position; and

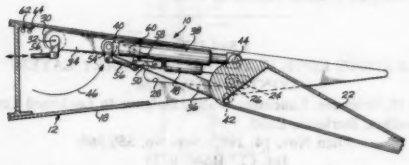
second actuation means coupled to said wing and to said door member adapted to move said door member from said extended position to said retracted position.

4,544,118

DRIVE MECHANISM FOR COMBINED FLAP-AILERON SURFACE

Curtiss W. Robinson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 431,759
Int. Cl.[4] B64C *9/06, 9/18*
U.S. Cl. 244—225 **27 Claims**



1. In an aircraft:

a slotted wing comprising a main wing structure having upper, lower and forward edge skin surfaces and a rear recess, and a combination flap-aileron having upper and lower skin surfaces, a forward edge, and a hinge axis, said wing skin surfaces establishing a wing skin envelope;

fixed position track means carried by the main wing structure totally within the wing envelope, mounting said flap-aileron for fore and aft movement relative to the main wing structure, between a forward position in which the forward edge of the flap-aileron is received within the recess and a rearward position in which said forward edge is spaced rearwardly of the recess; and

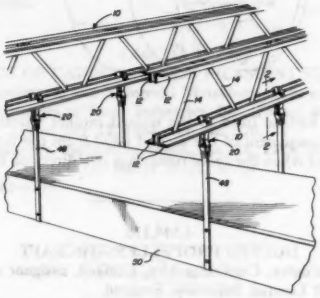
positioning means for said flap-aileron operable for driving the flap-aileron fore and aft along said fixed position track means, and for holding the flap-aileron in position at any location at or between the forward and rearward positions of the flap-aileron, and for rotating the flap-aileron about said hinge axis at any position of the flap-aileron along said track means, and for holding the flap-aileron in a selected rotational position within a range of rotational positions, wherein fore and aft movement of the flap-aileron along said fixed position track means and rotation of the flap-aileron about said hinge axis are each independent of the other.

4,544,119

BAR JOIST SUPPORTED SUSPENSION CLIPS

Roger N. Kellett, 4128 Currell Dr., and Clayton J. Hicks, 7816 Lawton Ave., NW., both of Lawton, Okla. 73505

Filed Nov. 1, 1983, Ser. No. 547,635
Int. Cl.[4] E21F *17/02*
U.S. Cl. 248—58 **6 Claims**



1. In combination with a bar joist of the type including a pair of closely laterally spaced horizontally elongated upright flanges including exposed upper marginal edge portions, a resilient clip including a pair of upstanding arm portions having upper and lower ends, at least the upper ends of said arm portions being spaced apart in the static condition of said clip, means joining said lower ends and including suspension structure adapted to suspend a selected article therefrom, said upper ends of said arm portions including integral downwardly and oppositely outwardly inclined catch flanges supported therefrom with each arm portion upper end and the associated catch flange defining a downwardly opening channel on the outer side of the corresponding arm portion remote from the other arm portion upper end, said catch flanges being relatively downwardly divergent and including remote upwardly convergent outer side wedge surfaces for camming the upper ends of said arm portions toward each other as said clip is upwardly displaced between said flanges from therebelow to a level with the lower ends of said catch flanges disposed above said upper marginal edge portions, said clip being sufficiently resilient, after the upper ends of said arm portions have been cammed together for passage between said flanges, to reassume said static positions thereof, whereby said channels will be aligned with said upper marginal edge portions and seatingly receive the latter therein when said clip is subsequently slightly lowered relative to said flanges and said clip will be anchored to said flanges against further downward displacement relative thereto, the spacing between the remote sides of the lower ends of said catch flanges, when the upper ends of the opposing sides of said arm portions are abutted against each other, being at least slightly greater than the spacing between the adjacent sides of said upright flanges, whereby upward insertion of the upper ends of said arm portions between the adjacent sides of said upright flanges necessitates not only flexure of said arm portions to positions with the adjacent sides of the upper end portions thereof abutted together but also inward flexure of the lower ends of said catch flanges toward the opposing outer sides of said arm portions.

4,544,120

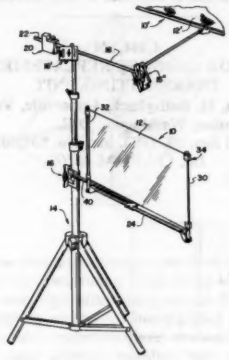
FLAG FRAME AND CLAMP

Ross Lowell, Pound Ridge, N.Y.; Marvin Seligman, Teaneck, N.J., and Edward Calamai, Pleasantville, N.Y., assignors to Lowel-Light Manufacturing, Inc., N.Y.

Division of Ser. No. 483,488, Apr. 11, 1983,. This application Jul. 23, 1984, Ser. No. 633,331

Int. Cl.[4] A47B *97/08;* **A47G** *1/24;* **B60R** *1/02*

U.S. Cl. 248—122 **12 Claims**



1. A frame for supporting at least one light modifying sheet, comprising:

a main rod having first and second free ends and a main axis;

a first hinge connected to said main at said first free near end thereof;

a second hinge connected to said main rod at said second free an opposite end thereof;

a third hinge connected to said first and second free ends main rod at a location thereon intermediate said first and second free ends;

a frame support rod connected to said third hinge and pivotally mounted about a first axis through said third hinge to said main rod;

a sheet support rod pivotally connected to each of said first and second hinges and pivotable therethrough about respective second and third axes which are fixed with respect to said main rod, said second and third axes being parallel to each other and perpendicular to said first axis, said second and third axes being respectively spaced outwardly from said first and second free ends of said main rod and being laterally spaced from said main axis of said main rod by distances to permit rotation of said sheet support rod to a folded position parallel to said main rod and through about 270° to an erected position perpendicular to said main rod and with sides of said sheet support rods engaged respectively near said first and second free ends of said main rod said frame support rod and said main rod lying in a common plane with said plane being perpendicular to a second plane which includes said sheet support rods when in their erected positions.

4,544,121

SUPPORT APPARATUS FOR MEDICAL APPLIANCE

Selichi Komura, Sumiyoshi, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

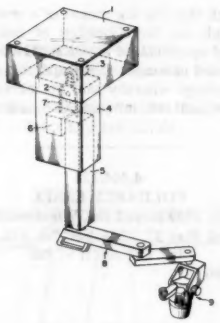
Continuation of Ser. No. 462,094, Jan. 28, 1983, abandoned. This application Jan. 4, 1985, Ser. No. 688,284

Claims priority, application Japan, Feb. 3, 1982, 57-12977[U]

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—331 **12 Claims**

1. A support apparatus for a medical appliance comprising support means having a vertical side surface and vertical guide means, lifter means adapted for mounting said medical appliance and positioned in said support means to be guided in vertical direction by said guide means, said lifter means having a vertical side surface adjacent to said vertical side surface of the support means, counterweight means, first pulley means provided on said support means at a level higher than said counterweight means for rotation about a horizontal axis, parallel link means including a plurality of parallel link arms each having one end pivotably connected with said lifter means and extending obliquely downward towards said vertical side surfaces of said support means, brake shoe means mounted on the other end of said parallel link arms and located between said vertical side surface of said lifter means and said vertical side surface of said support means, said brake shoe means having a friction surface facing the vertical side surface of said support means, a relatively small force spring means for biasing said brake shoe means upwardly with respect to said lifter means, second pulley means provided on said lifter means at a level below said brake shoe means for rotation about a



horizontal axis, wire means having one end connected to said counterweight means and passing around and extending downwardly from said first pulley means and passing around said second pulley means and having its other end connected to the brake shoe means, such that normal tension in said wire means forces said brake shoe means in the downward direction against the biasing force of said spring means and causes the parallel link arms to be held downward so that the brake shoe means is maintained away from the vertical side surface of the support means and in abutting engagement with said vertical side surface of said lifter means, and such that decreased tension in said wire means permits the friction surface of the brake shoe means to be forced into contact with the vertical side surface of the support means under the biasing force of the relatively small force spring means, at which time said parallel link means allows the brake shoe means to be forced more tightly against the vertical side surface of the support means by the weight of the lifter means.

4,544,122

ADJUSTABLE HEIGHT SUPPORT DEVICE FOR A VIDEO DISPLAY UNIT OR THE LIKE

Donald L. Bumgardner, South Lyon, Mich., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 26, 1984, Ser. No. 624,833

Int. Cl.[4] A47B *91/00*

U.S. Cl. 248—346 **4 Claims**

1. An interlocking support device for a video display unit or the like, said support device comprising:

one or more generally identical modules;

each said module having an upper section and a lower section, wherein both the lower section of said module can mate with the upper section of another module and the upper section of said module can mate with the lower section of another module;

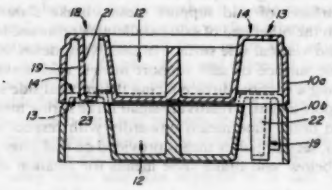
a plurality of leg means within the bounds of said module,

protruding from said upper section toward said lower section;

each said leg means supporting a lip member;

a plurality of openings through the upper section, corresponding to said leg means;

each said opening having both a large portion and a smaller portion such that the leg means of a mating module can pass through the large portion of said corresponding opening and upon relative rotation of two mating modules said leg means can enter said respective smaller portions of said openings whereby said lip members prevent the separation of said two modules along a longitudinal direction.



4,544,123

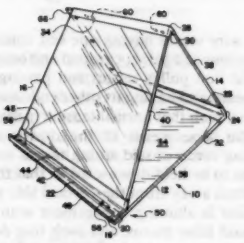
FOLDABLE EASEL

Peter R. Peacock, 2129 Royall Dr., Winston-Salem, N.C. 27106

Filed May 17, 1984, Ser. No. 611,178

Int. Cl.[4] A47B *97/08*

U.S. Cl. 248—460 **9 Claims**



1. A foldable easel for selective use in supporting books, sheet material and the like, comprising a planar base sheet member, a planar intermediate sheet member, a planar outer sheet member, an L-shaped lip member, hinge means pivotably connecting opposite ends of said intermediate sheet member to respective ends of said base sheet member and said outer sheet member and pivotably connecting one end of said lip member to the free end of said outer sheet member for selective pivotal movement between a folded condition wherein said base, intermediate and outer sheet members are disposed in a Z-shaped orientation in stacked parallel relation with said base and outer sheet members at opposite sides of said intermediate sheet member, with said one end of said lip member extending generally coplanarly with said outer sheet member, and with the other end of said lip member extending generally transversely to said outer sheet member and adjacent to said hinge means between said intermediate sheet member and said base sheet member, and an erected condition wherein said base, intermediate and outer sheet members are oriented in triangular relation to one another with the free ends of said base and outer sheet members adjacent one another with said one end of said lip member lying on and in parallel relation with said base sheet member and the other end of said lip member extending away therefrom for operative disposition with said base sheet member horizontal and said outer and intermediate sheet members upstanding convergingly therefrom for supporting and retaining sheet material on said lip member and against said outer sheet member, first mating connecting means at said one end of said lip member and said free end of said base sheet member for releasably holding said lip member and said base sheet member together in said erected condition, and second mating connecting means at each end of said intermediate sheet member cooperative with said first connecting means for releasably holding said base, intermediate and outer sheet members and said lip member together in said folded condition.

4,544,124

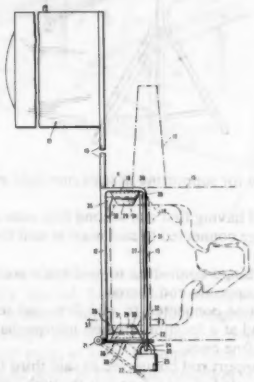
MOUNTING FOR CABOOSE REPLACEMENT SIGNAL TRANSMITTING UNIT

Harry A. deButts, II, Balleyhack, Upperville, Va., assignor to Syscon Corporation, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 537,805

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—552 **16 Claims**



1. A mounting for a caboose replacement signal transmitting unit comprising a bifurcated mounting bracket having spaced substantially parallel leg portions adapted to straddle the knuckle of a rail car coupling in a front-to-back plane and having a top wall interconnecting said leg portions above the top of the knuckle, releasable means on the mounting bracket and extending near and across the bottom of said knuckle to lock the bifurcated bracket to the knuckle, depending and upstanding stabilizing teeth on said top wall and said releasable means respectively adapted to engage top and bottom surfaces of the knuckle when the releasable means is in a substantially horizontal position locking the bracket to the knuckle, and an extension on the mounting bracket at its top of sufficient length to support a caboose replacement signal transmitting unit at an elevation above the top of a rail car coupling crown.

4,544,125

SIGN BRACKET

James R. Seely, Rochester, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Nov. 17, 1982, Ser. No. 442,419

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—624 **24 Claims**

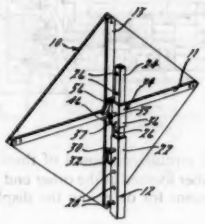
1. A bracket for mounting a sign on a sign stand, said sign having at least one mounting means thereon and said stand including a base and an upstanding member connected to said base, said bracket comprising:

bracket mounting means for mounting said bracket on said upstanding member of said stand;

sign attachment means for selectively attaching said sign mounting means to said bracket and for selectively releas-

ing said sign mounting means from said bracket, said sign attachment means including a pair of channel members spaced apart from each other and in which said sign mounting means can be received and positioned, a pair of latching means each adapted to cooperate with an associated one of said channel members to at least partially circumscribe said sign mounting means in order to retain said sign mounting means in said channel member; and

said latching means being pivotally relative to said bracket



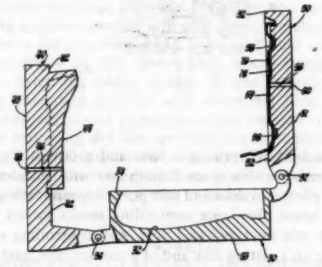
for selective pivotal movement into and out of said cooperating and circumscribing relationship with said channel members, said sign attachment means further including resilient biasing means for biasing said pivotal latching means into said cooperating and circumscribing relationship with said channel member, said resilient biasing means and said latching means being adapted to resiliently allow pivotal movement of said sign while maintaining at least one of said latching means in said partially circumscribing relationship with said sign mounting means.

4,544,126

MOLDING APPARATUS FOR SIMULTANEOUSLY FORMING A CAVITY AND ENCAPSULATING A FRAME IN A FOAMED BODY

Walter K. Melchert, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1984, Ser. No. 656,750
Int. Cl.[4] B29C *1/00, 1/14;* B29D *3/02*
U.S. Cl. 249—83 **2 Claims**



1. A mold for molding a hollow, unitary foamed article having a frame member embedded therein wherein said article comprises a first-molded foam section, a second-molded foam section integral with said first-molded section about the periphery of said frame member and at least one cavity between said sections and defined in part by said frame, said mold comprising:

(A) a first mold member adapted to sequentially sealingly engage second and third mold members for shaping said article in at least two molding operations;

(B) a second mold member coacting with said first mold member in a closed position to define a first mold cavity for shaping said first-foamed section;

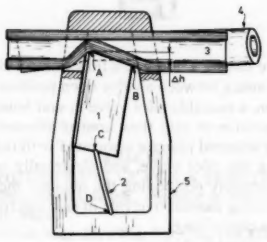
(C) a third mold member coacting with said first mold member in a closed position for positioning said frame member in spaced relation to said first-foamed section to define said cavity therebetween, said third mold member including means for detachably securing said frame member in spaced relation to said third mold member for release therefrom following molding of said second-molded section and such as to define a second mold cavity between said frame and said third mold member for shaping said second-foamed section, said second mold cavity being in communication with the first mold cavity at the periphery of said frame member for integrating said foamed sections together thereat.

4,544,127

BISTABLE VALVE

Zsolt Szabó, Budapest, Hungary, assignor to Labor Muszeripari Muvek, Hungary

Filed Dec. 14, 1983, Ser. No. 561,560
Int. Cl.[4] F16L *55/14*
U.S. Cl. 251—9 **1 Claim**



1. A bistable valve construction for alternately clamping at least one of at least two parallel flexible hoses, comprising a housing having a compression surface, a closure member disposed in said housing, and a biasing means; said closure member having a first end which has two closure edges disposed on it, one on either side of said first end, said closure edges being parallel and offset with respect to each other; said closure member having a second end; said flexible pipes being disposed between said compression surface and said first end of said closure member; said biasing means acting on said second end to bias it in a direction generally towards said compression surface; said closure member being constrained by said biasing means in cooperation with said housing for angular motion between two extreme positions such that said first end is substantially stationary and is promixate said compression surface, while said second end moves generally along an arc centered at said first end; whereby when said closure member is in one of its extreme position, at least one of said at least two parallel flexible pipes is clamped against said compression surface by one of said closure edges to prevent flow therethrough while flow is permitted in at least one other of said at least two flexible pipes; and when said closure member is in its other extreme position, the other of said closure edges clamps said at least one other flexible pipe against said compression surface to prevent flow therethrough while flow is permitted in said at least one flexible pipe; and whereby, as said closure member is switched from one extreme position to the other, flow is not permitted in said at least one flexible member until said at least one other flexible pipe is firmly clamped against said compression surface by said other closure edge.

4,544,128

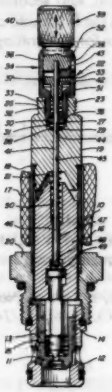
CARTRIDGE SOLENOID VALVE WITH MANUAL OVERRIDE

Abel E. Kolchinsky, Glenview, and Shaukat A. Kazi, Chicago, both of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Feb. 24, 1983, Ser. No. 469,469

Int. Cl.[4] F16K *31/05*

U.S. Cl. 251—30.01 **14 Claims**



1. In a valve having a housing, a flow control element movable in said housing between a valve open position and a valve closed position, a movable pilot valve in said housing for controlling the position of said flow control element, a reciprocally movable solenoid plunger associated with the pilot valve for positioning the pilot valve, and electrically operable coil means for selectively positioning the plunger, means for providing a fast-acting manual override of said electrically operable coil means comprising:

a manually operable element;

a control member for connecting the manually operable element to said solenoid plunger;

releasably engageable shoulder means defining a first shoulder in fixed relationship to said housing and a second shoulder movable with said manually operable element, said means defining said second shoulder further defining means releasable securing the manually operable element to said control member; and

means responsive to selective manipulation of said manually operable element for selectively positioning the shoulder means for (a) locking said control member in a preselected first position wherein the solenoid plunger is operable by the electrically operable coil means or (b) releasing said control member in a second position; and

means for rapidly effecting manually controlled override of the electrically operable coil means and positioning of the flow control element in the valve open position with the shoulder means in the second position such as in the event of failure of said electrically operable means.

4,544,129

DIRECT-ACTING SERVO VALVE

Ken Ichiryu; Haruo Watanabe, and Takashi Yamaguchi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,177

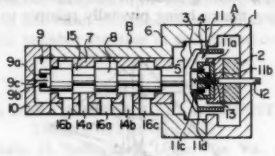
Claims priority, application Japan, Dec. 20, 1982, 57-222028

Int. Cl.[4] F15B *13/044*

U.S. Cl. 251—129.01 **7 Claims**

1. In a direct-acting servo valve wherein a spool is directly driven by a force motor including a coiled first bobbin located in a first magnetic circuit composed of a first yoke and a first magnet mounted on the yoke, the improvement comprising:

a second magnetic circuit composed of a second yoke and a second magnet located at one end of the spool and serving as a means for detecting the velocity of the spool; and



a third magnetic circuit composed of third magnets and a magnetic member located at the other end of the spool and serving as a means for detecting the displacement of the spool.

4,544,130

CHOKE UNIT

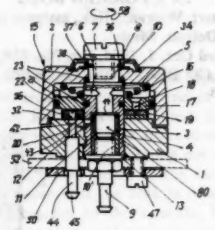
Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, Fed. Rep. of Germany, and Hans-Heinrich Glättli, Seestrasse 252, CH-8700 Küsnacht/Schweiz, Switzerland

Filed Aug. 6, 1984, Ser. No. 637,849

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 8324276[U]

Int. Cl.[4] F16K *47/06*

U.S. Cl. 251—208 **23 Claims**

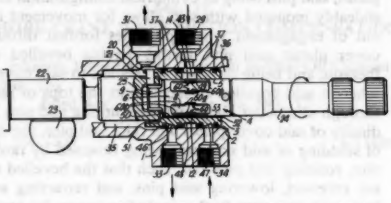


1. A choke unit comprising a base and a cover, together forming a housing with a space therein and with an inlet duct and an outlet port, said duct and said port communicating with said housing space, flow rate controlling means joined fluidwise between said duct and said port, said controlling means being made up of a setting disk and of a contact disk, said disks making sealing contact with each over a contact interface, said disks being able to be turned in relation to each other about an axis while maintaining said contact interface, one of said disks having a groove therein within the area of said contact interface, said groove running circumferentially around said axis for less than 360° and increasing in cross section circumferentially, holes in at least one of said disks communicating with said groove for conducting fluid into and out of a given length of said groove which may be changed by relative rotation of said disks, said holes being joined with said inlet duct and with said outlet port, a pillar for sealingly supporting one of said disks, said inlet duct being within said pillar, said setting disk being joined with said cover so as to be turned thereby, and radially fitting against said cover and said pillar so as to make sealing contact with both of them.

4,544,131
ROTARY VALVE

Frederick J. Adams, Clevedon, England, assignor to TRW Cam Gears Limited, Hertfordshire, England

Filed Jul. 9, 1984, Ser. No. 629,213
Claims priority, application United Kingdom, Aug. 5, 1983, 8321220
Int. Cl.[4] F16K *11/083;* B62D *5/08*
U.S. Cl. 251—309 7 Claims



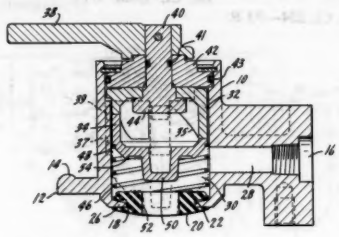
1. A rotary valve for controlling fluid flow to opposite pressure chambers of a double-acting fluid motor for providing power assistance in a steering gear, said rotary valve comprising a generally cylindrical sleeve having an axial bore therethrough, said sleeve having a plurality of port means communicating fluid flow through said sleeve, a rotor mounted in said axial bore, relative rotation between said rotor and sleeve controlling fluid flow through said plurality of port means, said plurality of port means including inlet port means extending radially through said sleeve and communicating with a source of fluid and return port means communicating with a reservoir, fluid flow through said inlet and return port means being controlled by circumferential displacement of axially extending control edges on said rotor extending along the length thereof relative to control edges of said inlet and return port means formed by the intersection of said inlet and return port means with said axial bore, said return port means including a plurality of axially extending grooves formed in the inner surface of said axial bore in said sleeve, said inner surface of said sleeve being free of axially extending grooves other than said return port means, said sleeve having opposite radially extending end faces partially defining fluid chambers on the opposite ends of said sleeve which chambers are connected in fluid communication with said reservoir, and said axially extending grooves opening into said opposite radially extending end faces for communicating with said fluid chambers, the control edges on said return port means being defined by axially extending edges formed by the intersection of said axially extending grooves with said axial bore, said axially extending edges and respective edges on said rotor defining axially extending slot-like apertures the circumferential extent of which varies upon relative rotation of said sleeve and rotor to increase or decrease fluid flow from a pressure chamber of said double-acting fluid motor to said opposite fluid chambers.

4,544,132
COMBINATION GLADHAND AND SHUTOFF VALVE

Charles S. Allen, River Forest; Arthur A. Berg, Northbrook; Eugene W. Schmitt, Lockport; Michael R. Stoltenberg, Des Plaines, and Frederic Lissau, Chicago, all of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Feb. 28, 1983, Ser. No. 470,232
Int. Cl.[4] F16K *1/00*
U.S. Cl. 251—318 9 Claims

1. A combination gladhand and shutoff valve for use in gladhand coupling applications including a gladhand body having an air inlet and an air outlet, a seal member positioned at said air outlet and having a central passage therein, said seal member being attached to said gladhand body and having a portion thereof positioned exteriorly thereof so as to form a seal with a mating gladhand fitting, a chamber within said body connecting said inlet and outlet, a valve plug movable within said chamber toward and away from said seal member along a path coaxial with said outlet and seal member, said valve plug including a body portion and a nose member mounted thereon, said nose member being movable relative to said body portion to insure alignment of the nose member and

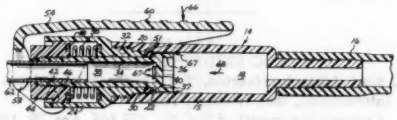


the seal member passage when the valve plug is moved to a valve closing position, said valve plug nose member further including a circumferential rim positioned for contact with said seal member radially outside of said central passage to form a seal between said seal member and valve plug in the valve closing position.

4,544,133
SHUT-OFF VALVE FOR A SPRAYER

Dean E. Collins, Lowell, Mich., assignor to Root-Lowell Mfg., Co., Lowell, Mich.

Filed May 25, 1984, Ser. No. 613,818
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—344 4 Claims



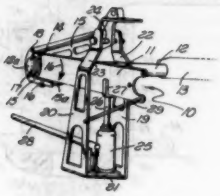
1. A shut-off valve for a sprayer, said valve comprising a housing having an inlet adapted for flow communication with a fluid source, said housing including an internal bore in flow communication with said inlet, a valve stem slidably positioned within said housing bore between open and closed position, said stem including a longitudinal bore in flow communication with an outlet at one end of the stem, a transverse opening in said stem into said longitudinal bore therein to provide flow communication between said housing bore and said stem longitudinal bore, and an annular sealing means positioned about said stem and contacting the stem and said housing for sealing the stem and housing against fluid flow therebetween at both open and closed positions of said stem, said sealing means when said stem is in its closed position for preventing fluid flow through said stem transverse opening, said sealing means when said stem is in its open position being spaced from said stem transverse opening for allowing fluid flow through said opening and stem bore to said stem outlet, and actuation means for urging said stem into a selected one of its said closed and open positions.

4,544,134

TOOL FOR TORSION BAR REMOVAL

Thomas Mitchell, 6480 Winevillea Ave., Mira Loma, Calif. 91752

Filed Nov. 25, 1983, Ser. No. 555,193
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 R **7 Claims**



1. Apparatus for removing a torsion bar from a rear engine Volkswagon vehicle said torsion bar being inwardly anchored by a spline connection to the structure of said vehicle, comprising:

an A-frame having a substantially horizontal base plate from which two attached upwardly converning legs extend to form an apex;

means for attaching said converging legs adjacent said apex to a fixed structural member of said vehicle above the cantilevered arm which normally couples the outer end of said torsion bar to a wheel assembly of said vehicle, said arm resting on a stop integral with said vehicle structure and projecting between said A-frame legs;

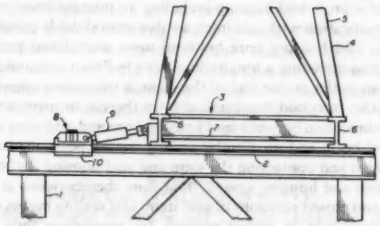
means for applying a compressive force between said base plate and the lower edge of said arm and thereby applying a compressive force between said apex and said arm to rotate said arm upward by a predetermined amount without applying a net lifting force to said vehicle such that a separate outward force can be applied to partially outwardly disengage said torsion bar axially such that subsequent release of said compressive force permits said arm to rotate downward, without engaging said stop, to a position in which said torsion bar is substantially unloaded permitting the complete removal of said torsion bar from its inward spline connection.

4,544,135

RIG SKIDDING SYSTEM

E. Kurt Albaugh, Houston, Tex., assignor to Dolphin Titan International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 373,166, Apr. 29, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,124
Int. Cl.[4] B65G *7/00*
U.S. Cl. 254—108 **1 Claim**



1. An apparatus for skidding a heavy skid base and drilling substructure along the surface of an offshore drilling platform to position drilling equipment over a particular well, said apparatus comprising:

(a) at least two cover plates appropriately attached to the top flanges of a like number of I-beams, each of said cover plates having a plurality of holes formed therethrough;

(b) a claw adapted to mount over each of said cover plates, each of said claws including a guide plate for engaging said I-beams, said guide plates being adjustably mounted with said claws, whereby said claws are adaptable to various widths of I-beams, and including a pin mounted to each of said claws for engaging said holes in said cover plates to prevent movement of said claws with respect to said cover plates, said pins being of cylindrical configuration and being slideably mounted with said claws for movement into and out of engagement with said holes formed through said cover plates, said pins further having bevelled surfaces thereon, and being disposed in relation to said cover plates wherein said bevelled surfaces abutt the tops of said holes through said cover plates whereby urging said pins longitudinally of said cover plates will raise said pins, the direction of skidding of said skid base being reversed by raising said pins, rotating said pins 180° such that the bevelled surfaces are reversed, lowering said pins, and retracting said skid base, said apparatus further including means for urging said pins downwardly into engagement with said holes formed through said cover plates; and

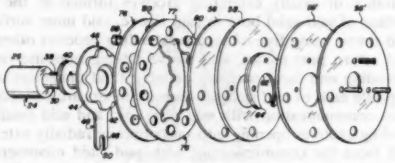
(c) means attached between said skid base and said drilling substructure and each of said claws for moving, in an extensible and/or retractible manner, said skid base and drilling substructure with respect to said claws.

4,544,136

TIRE LIFT/CARRIER

Stephen A. Denman, Centerville, and Jack J. Powell, Kettering, both of Ohio, assignors to Joseph Deuer and James Deuer, both of Dayton, Ohio

Continuation of Ser. No. 277,088, Jun. 25, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,278
Int. Cl.[4] B66D *1/04, 1/34, 1/54*
U.S. Cl. 254—323 **24 Claims**



18. Apparatus particularly advantageous for use as a tire lift/carrier comprising a rotatable spool, a line in connection with said spool, said spool comprising relatively thin plates positioned and secured together substantially coaxially of one another in a side by side face abutting relation, a portion of said plates intermediate the axial limits of said spool having a circumferentially extending outer peripheral edge portion thereof recessed with respect to the outer peripheral limits of immediately bounding portions of said plates to define therewith a track and provide a base on which said line may wrap about said spool, said base having the circumferential extent thereof, which is otherwise formed on a generally uniform radius for a distance closely approaching 360 degrees, interrupted by a further recess directed inwardly thereof, said recess having its circularly spaced outer limits, which define the relatively adjacent remote ends of said base, defined by smoothly contoured edge portions of said portion of said plates which respectively smoothly merge with said remote ends of said base, said contoured edge portions being formed to extend substantially radially inward of said base immediately thereof, aligned apertures provided in those plate portions which bound said base, said apertures extending in a direction axially of said spool and having at least portions thereof adjacent said base, one end of said line having means extending in a direction transversely with respect to said recess to have portions

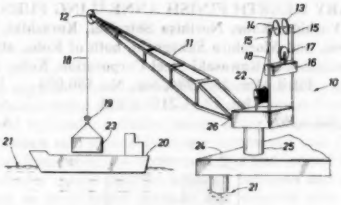
thereof respectively extend into said aligned apertures of those plate portions which immediately bound said base and to bear therein on bounding surface portions thereof in use of said line, said line being thereby connected and made captive to said spool in a construction and arrangement providing for an inherent adjusting movement of said one end of said line which is held captive to said spool as said line is wrapped on and unwrapped from said base in use thereof.

4,544,137

OFFSHORE CRANE WAVE MOTION COMPENSATION APPARATUS

Paul R. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 12, 1984, Ser. No. 599,312
Int. Cl.[4] B66D *1/50*
U.S. Cl. 254—337 **6 Claims**



1. Wave motion compensation apparatusm, for use in an offshore crane, comprising:
winch means carried by said crane,
line operatively connected to said winch means,
load attachment means operatively connected to said line,
a traveling weight operatively connected to said line,
a vertical track operatively engaged and positioned adjacent said traveling weight in sliding engagement therewith,
unidirectional locking means having a first and a second portion, one of said portions operatively connected to said traveling weight and the other of said portions operatively connected to said vertical track,
actuation means for said unidirectional locking means, said actuation means carried by said traveling weight and operatively engaging one of said portions of said unidirectional locking means,
line direction sensing means carried by said wave motion compensation apparatus, operatively engaging said line means, for selectively generating a line direction output signal indicative of the direction of movement of said line, and
signal transmission means operatively connected between said line direction sensing means and said actuation means for transmitting said line direction output signal of said line direction means to said actuation means.

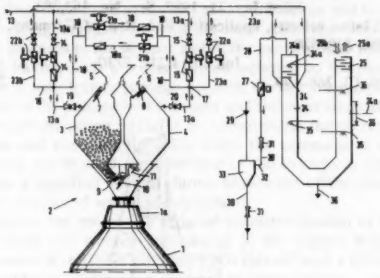
4,544,138

DISCHARGE OF TOP GASES FROM BLAST FURNACES OR THE LIKE

Heinz Peterseim, Zweibruecken, and Walter Leutz, Bierbach-Wolfersheim, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 8, 1983, Ser. No. 559,572
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245374
Int. Cl.[4] C21B *7/22*
U.S. Cl. 266—44 **11 Claims**

1. Method of reducing the pressure of top gases discharged from a blast furnace or the like into a storage bin during discharge of the content of the bin into the blast furnace, comprising the steps of:
feeding in a first phase dust laden top gas at elevated pressure into a chamber filled with clean air at ambient temperature and pressure under utilization of the formation of a pressure wave;
concurrently discharging said air by operation of said pressure wave through a sound attenuation device into the outer atmosphere;



feeding in a second phase the top gas from said chamber under dilution with clean air into a low pressure stage under concurrent separation from the storage bin from which the top gas was discharged in said first phase; and
de-dusting the diluted top gas as discharged from said low pressure stage.

4,544,139

COATED EXOTHERMIC CUTTING ELECTRODE

Paul E. Moore, Glouster; Robert L. Strohl, and Lawrence R. Soisson, both of Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Oct. 18, 1984, Ser. No. 662,207
Int. Cl.[4] B23K *35/02*
U.S. Cl. 266—48 **10 Claims**

1. In an exothermic cutting electrode of the type having a mass of metal such as a plurality of elongated rods or wires, helically wound wire or solid mass of metal with a central aperture adapted to function as as electrode the improvement comprising in combination:
said electrode coated with a mixture containing an oxidizing material, arc stabilizing material and a binder wherein said coating is provided with a plurality of generally parallel longitudinal portions of reduced thickness said portions extending substantially the length of the coating.

4,544,140

DEVICE FOR MEASURING THE LEVEL OF THE INTERFACE BETWEEN A SLAG LAYER AND A BATH OF MOLTEN METAL IN A METALLURGICAL VESSEL

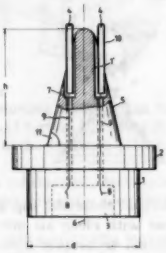
Werner Tenberg, Ratingen, Fed. Rep. of Germany, and Gustav Kolb, Im Ohl 52, 5870 Hemer, Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf and Gustav Kolb, Hemer, both of, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,383

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3205528

Int. Cl.⁴ C21C *5/30*

U.S. Cl. 266—99 **7 Claims**



1. A device for measuring the depth of the level of molten metal within a metallurgical vessel and underneath a slag layer including a carrier member for insertion into an elongated carrier tube; and an annular flange member on the carrier member and serving as a stop for the carrier tube and having an oppositely oriented surface; the improvement comprising:

an electrode holder on said surface extending therefrom and being of tapering configuration and wherein the tapering surface is at least partially rounded, said tapering member having a height which is not smaller than the diameter of said carrier member; and

a pair of electrodes inserted in bores in said electrode holder and anchored therein, there being electrical connections running from the electrodes into said carrier.

4,544,141

PROCESS AND APPARATUS FOR CONTINUOUS CONVERTING OF COPPER AND NON-FERROUS MATTES

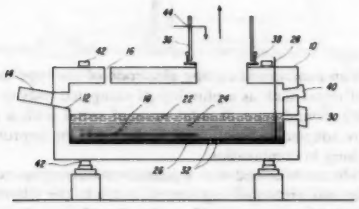
Phillip J. Mackey, Pointe Claire, and J. Barry W. Bailey, Noranda, both of Canada, assignors to Noranda Inc., Toronto, Canada

Division of Ser. No. 490,021, Apr. 29, 1983, Pat. No. 4,504,309. This application Dec. 21, 1984, Ser. No. 685,235

Claims priority, application Canada, Jun. 18, 1982, 405473

Int. Cl.⁴ C21C *5/42*

U.S. Cl. 266—215 **9 Claims**



1. Apparatus for the continuous converting of non-ferrous matte comprising a horizontal generally elongated furnace which is stationary during normal operation, having:

(a) means for at least intermittently introducing a liquid feed matte into the furnace throughout the converting;

(b) a set of tuyeres along one side of the furnace for continuously blowing an oxidizing gas into the melt at a rate in balance with the rate of liquid feed matte and the desired degree of oxidation;

(c) means for introducing flux into the furnace at a rate in balance with the feed matte and said oxidizing gas;

(d) an off-gas port;

(e) a first discharge port at the end away from the tuyeres for removing slag from the top of the melt while said oxidizing gas is continuously blown into the melt; and

(f) a second discharge port for removing a refined product from beneath the melt while said oxidizing air is continuously blown through the melt.

4,544,142

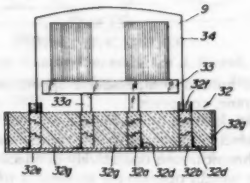
ROTARY HEARTH FINISH ANNEALING FURNACE

Shigeru Yoshida, Kobe; Norihisa Shiraishi, Kurashiki; Chosei Asakawa, and Morohira Sakaguchi, both of Kobe, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 15, 1984, Ser. No. 590,074

Int. Cl.⁴ C21D *9/673*

U.S. Cl. 266—252 **4 Claims**



1. A rotary hearth finish annealing furnace including coil tables carrying thereon steel plate coils to be annealed with their axes being vertical, a hearth traveling along a circle having a predetermined radius, said coil tables being supported on said hearth so as to permit said coils to be arranged thereon in at least two circular rows on a single plane concentric to said traveling circle of said hearth, inner covers covering said coils on said coil tables, a protective cover covering said above members over a predetermined distance, and heating means for heating an interior of the furnace located at a level above upper ends of said steel plate coils, said hearth including one portion formed of a relatively higher strength refractory materials and another portion made of relatively lower strength refractory materials, wherein said portions of the hearth subjected to the load of the coil tables and coils are made of firebricks, said one portion of said hearth subjected to the load of the inner covers being formed of thermal insulating bricks, and said other portion being formed of a light-weight refractory material.

4,544,143

TAPHOLE PLUGGING APPARATUS FOR A SHAFT FURNACE

Arthur Cooper, Burlington, Canada, and Pierre Mailliet, Howald, Luxembourg, assignors to Paul Wurth, S.A., Luxembourg

Filed Apr. 20, 1984, Ser. No. 602,510

Claims priority, application Luxembourg, Apr. 21, 1983, 84764

Int. Cl.⁴ C21B *7/12*

U.S. Cl. 266—273 **14 Claims**

1. An apparatus for plugging the taphole of a shaft furnace comprising:

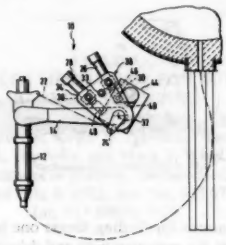
jib means, said jib means being rotably mounted about a first support column;

clay gun means, said clay gun means pivotably mounted on a first end of said jib;

pivotable frame means, said frame means being attached to a second end of said jib and being pivotable about said first support column;

first hydraulic cylinder means being pivotably attached between a second end of said jib means and said pivotable frame means;

a second support column;



fixed support frame means, said first and second support columns being attached to said fixed support frame means;

second hydraulic cylinder means being pivotably attached between said pivotably frame means and said fixed support frame means wherein said first and second hydraulic cylinder means may be actuated between and operative and an inoperative position and wherein said clay gun means sweeps out a trajectory, a portion of said trajectory being substantially low down and flat.

4,544,144

HYDROPNEUMATIC SPRING

Kunio Ishida, and Shinji Kaneko, both of Yokohama, Japan, assignors to Tokico Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 7, 1981, Ser. No. 223,169

Claims priority, application Japan, Jan. 14, 1980, 55/2797

Int. Cl.⁴ F16F *5/00, 9/06*

U.S. Cl. 267—64.15 **4 Claims**

1. A hydropneumatic spring comprising:

(A) a cylinder having an open end and a closed end; and

(B) a rod guide fitted to the open end of the cylinder and having a passage therein; and

(C) a packing means provided adjacent to said rod guide and within the cylinder in sealing engagement with the inner circumference of the cylinder and having a passage therein which is in alignment with the passage in the rod guide; and

(D) a stopper means provided within the cylinder in sealing engagement with the inner circumference of the cylinder and having a passage therein, aid stopper means dividing the interior of the cylinder into an oil reservoir defined by the stopper and the packing and a working space defined by the stopper and the closed end of the cylinder; and

(E) a slidable piston within the working space adapted to contact the inner walls of the cylinder and having passage therein for communicating both sides of the working space partitioned by the piston; and

(F) a piston rod connected to the piston and extending outside the cylinder via the passages in the stopper, in the packing means and in the rod guide, said piston rod being in sealing engagement with the inner circumfcrences of the passages in the stopper and in the packing, said piston rod having such a recess thereon adjacent to the piston that it may form a passage between the inner circumference of the passage in the stopper and the outer circumference of the piston rod so as to communicate the oil reservoir and the working space when the extension of the piston rod beyond the other end of the cylinder is more than a specified amount during movement of the piston and piston rod within the cylinder

wherein the recess is a reduced diameter portion of the piston rod wherein the passage in the stopper is provided at the inner circumference thereof with a portion wider than the outer diameter of the piston rod

wherein the wider portion of the passage in the stopper is in fluid communication with the oil reservoir.

4,544,145

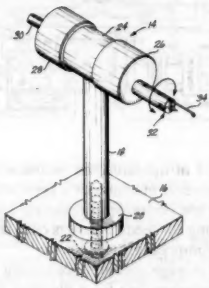
VISE FOR SMALL OBJECTS

Norman E. Norlander, 9002 Fruitland Ave., Puyallup, Wash. 98371

Filed Jun. 13, 1983, Ser. No. 503,426

Int. Cl.⁴ B23Q *1/04*

U.S. Cl. 269—69 **8 Claims**



1. A rotatable vise for holding small objects which comprises:

a. mounting means for attaching the vise to a fixed support;

b. a body means attached to the mounting means;

c. a freely rotatable arbor mounted in the body means, said arbor having a longitudinal axis essentially normal to the mounting means;

d. hubs mounted at each end of the arbor adjacent to the body means, one of said hubs being fixed to the arbor and the other adapted for limited sliding movement along the arbor, said hubs being of sufficient mass so that when the arbor is rapidly rotated in either direction the hubs supply inertial energy tending to maintain said rotation;

e. arbor locking means associated with the slideable hub, said means comprising a fixed pin mounted on the hub and a plurality of angularly spaced recesses located in the body means adjacent to the slideable hub and engagable by the pin so as to lock the arbor when the hub is moved along the arbor from a freely rotatable to a locked position; and

f. object clamping means mounted proximally on the fixed hub, said clamping means having a fixed member mounted

on said hub and a cooperating moveable member, said members having distally located, essentially planar, opposing jaw portions,

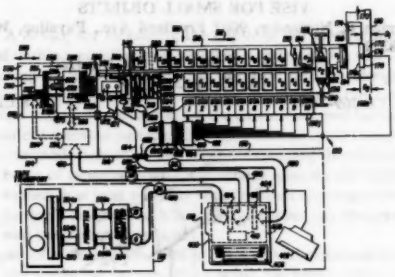
the clamping means having a longitudinal axis which lies offaxis from but essentially parallel to the longitudinal axis of the arbor means so that the longitudinal axis of the arbor means does not pass through the clamping means and the clamping means will normally assume a resting position below the longitudinal axis of the arbor means when the arbor is not locked.

4,544,146

INSERTION MACHINE WITH CONTROL SIGNALS STORED ON SEARCHABLE MEDIUM

Edward H. Zemke, deceased, late of Chicago, Ill. (by Anne Zemke, legal representative); Harold D. Pogue, Chicago; Girish B. Shah, Schaumburg, and Myron A. Bowles, Waukegan, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 23, 1983, Ser. No. 525,767
Int. Cl.[4] B65H *39/02*
U.S. Cl. 270—58 **3 Claims**



1. A method of operating an insertion machine system including an insertion machine of a type wherein a plurality of insert stations are positioned proximate conveyor means travelling therealong for feeding inserts onto said conveyor means, said method comprising the steps of:

accessing a storage medium containing information indicative of customer data for a plurality of customers;

acquiring a string of user-input characters representative of information to be sought on said storage medium;

searching said storage medium for a match between a string of stored characters and said string of input characters;

obtaining from said storage medium information indicative of customer data and insertion machine control signals relative to a customer, said information being associated on said storage medium with a string of matched stored characters;

communicating said insertion machine control signals relative to said customer to at least one insert station;

using said insertion machine control signals to control the selective feeding of inserts from said at least one insert station;

acquiring from a user an indication whether said storage medium is to be searched for a further string of stored characters resembling said string of previously-input characters; and,

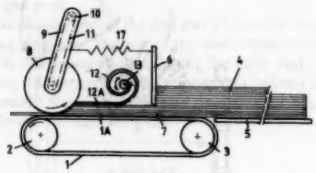
searching said storage medium for a further string of stored characters resembling said string of previously-input characters.

4,544,147

APPARATUS FOR FEEDING SHEETS ONE BY ONE

Johannes H. A. Dinnissen, Venlo, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed May 18, 1983, Ser. No. 495,672
Claims priority, application Netherlands, May 26, 1982, 8202141
Int. Cl.[3] B65H *3/52*
U.S. Cl. 271—35 **9 Claims**



1. In an apparatus for feeding sheets one by one, including conveyor means for engaging with and drivable to advance at least the outermost sheet of a group of at least partially overlapping sheets, sheet separating means comprising a roller positioned adjacent to said conveyor means so as to form therewith a nip for passing the outermost sheet therebetween and means for driving said roller to move its surface through said nip in a direction opposite to the direction of advance of sheets by the conveyor means,

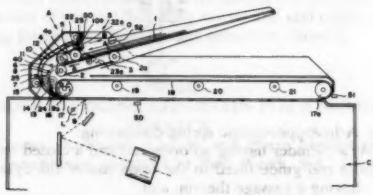
means for controlling the position of the sheets advanced toward said roller by said conveyor means, comprising a displaceable member disposed behind said nip and continually pressed toward said conveyor means and having an underside that admits under said member and presses slidably against a leading portion of a sheet or sheets in the vicinity of said nip, said member being displaceable relative to said roller in said direction of advance of sheets and in the direction perpendicular thereto, and said member having a forward end edge thereof continually disposed in slidable contact with said roller surface behind said nip.

4,544,148

AUTOMATIC ORIGINAL CONVEYING DEVICE

Tadayuki Kitajima; Kimiaki Hayakawa; Noriyoshi Ueda, all of Yokohama, and Masakazu Hiroi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 466,874
Claims priority, application Japan, Feb. 24, 1982, 57-28380; Feb. 24, 1982, 57-28381; Mar. 25, 1982, 57-47810
Int. Cl.[4] B65H *5/22*
U.S. Cl. 271—3.1 **10 Claims**



1. An automatic original conveying device for conveying an original to a reading position and thereafter retracting the original from the reading position, comprising:

means for supporting originals;

feeding means for separating and feeding a lowermost one of the orignals supported on said supporting means;

first guide means for leading the original fed by the feeding

means to the reading position in a reversed state to that of the originals located on the supporting means;

original retracting means for retracting the original led to the reading position from the same side as that at which the original has been led to the reading position; and

second guide means for returning the original to the supporting means from the same side as that from which the original has been fed, in a reversed state to that of said original retracted from the reading position.

4,544,149

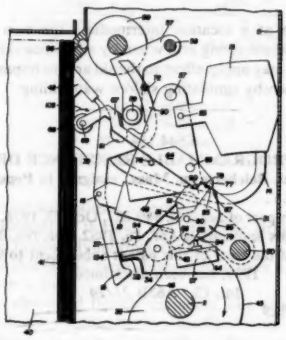
MULTI-PICKER MECHANISM FOR AUTOMATIC BANKING MACHINES

Harry T. Graef, Massillon; Jeffrey A. Hill, Canton; Scott A. Mercer, Hanoverton; Kevin H. Newton, North Canton; Gerald T. Sedlock, Hartville, and Mark J. Wise, North Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Feb. 4, 1982, Ser. No. 345,577

Int. Cl.⁴ B65H *3/08*

U.S. Cl. 271—107 **40 Claims**



1. Multi-picker mechanism for picking notes one at a time from a note supply stack in an ATM housing, including a picker housing; primary picker means mounted in the picker housing; secondary picker means switchably engageable with or disengageable from the primary picker means mounted in the picker housing; means for operating the primary picker means to pick notes from a note supply stack; and means enabled by the occurrence of a picking failure selectively to engage or disengage the secondary picker means with or from the primary picker means to reestablish picking operations.

4,544,150

DOCUMENT FEEDER

Robert Irvine, Riverside; Harry E. Luperti, Wilton, both of Conn., and Keith Bayliss, Swindon, England, assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 22, 1984, Ser. No. 582,363

Int. Cl.⁴ B65H *1/00*

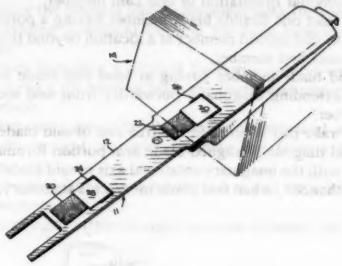
U.S. Cl. 271—145 **4 Claims**

1. A document feeding device, comprising:

a hopper oriented at an acute angle with respect to a horizontal plane and able to support a pack of documents to be fed seriatim therefrom;

at least one pad having a high coefficient of friction material situated on the upper surface of said hopper whereby the effect of the weight of the documents situated in the hopper above said pad on the pressure of the documents situated below said pad is decreased; and

means for adjusting the amount of pad to be exposed, said means including an aperture adjacent said pad at the upstream end thereof and a slide having a downstream end extending through said aperture and over said pad.



4,544,151

TRANSFER DEVICE FOR FILM CARD

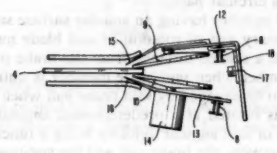
Peter Dziemba, Bad Nauheim, Fed. Rep. of Germany, assignor to MAP Mikrofilm Apparatebau Dr. Poehler GmbH & Co., KG, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,583

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239703

Int. Cl.⁴ B65H *9/16*

U.S. Cl. 271—251 **11 Claims**



1. A transfer device for transmitting a film card or the like guided between two guides from one position to another substantially in a single plane, comprising transport means movable transverse to the film card about a pivot axis from a first, rest, position to a second, gripping, position, for gripping and transporting the film card; two opposed rotary disks carried by said transfer means and movable towards each other to grip the card therebetween, said discs being mounted at an acute angle with respect to each other when in the gripping position; and means to rotate at least one of said discs with a reversible direction of rotation; said device being disposed at the transfer end of one of said guides.

4,544,152

PASSIVE-TYPE TREADMILL

Charles M. Taitel, 35 Union Rd., Parsippany, N.J. 07054

Filed Jul. 25, 1983, Ser. No. 517,079

Int. Cl.⁴ A63B *23/06*

U.S. Cl. 272—69 **5 Claims**

1. A governor assembly for use in treadmills and the like, comprising a rotatable member having an opening in one end thereof of a predetermined cross-section;

a second member having a cross-sectional configuration conforming to the shape of the opening in said first member slidably extending at least partially into the opening of said first member;

bias means engaging one end of said second member for normally biasing said second member in a first direction;

a pivotally-mounted cam member having a diagonally-

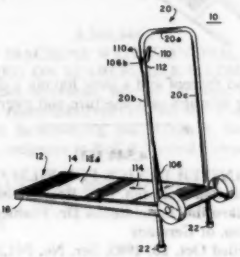
aligned cam surface engageable with the opposite end of said second member and limiting movement of said second member in said first direction in accordance with the angular orientation of said cam member;

at least one flexible blade member having a portion secured to said second member at a location beyond the one end of said first member;

said blade member having at least one blade arm portion extending diagonally outwardly from said second member;

a brake pad secured to the free end of said blade member;

said diagonally-aligned blade arm portion forming an angle with the imaginary rotational axis of said blade arm of less than 90°, when said blade member is stationary, said blade



arm portion being urged in a direction to increase said angle as a function of increasing rotational speed of said blade arm, the free end of said blade member generally defining a circular path;

a stationary member having an annular surface surrounding the imaginary axis of rotation of said blade member and positioned a spaced distance from the brake pad on said blade member when said blade member is stationary and adapted to be engaged by said brake pad when said blade member is rotated at a predetermined angular velocity, the value of said angular velocity being a function of the spacing between the brake pad and the stationary surface when the blade member is stationary, being adjusted by said cam member.

4,544,153

SLALOM WATERSKIING SIMULATOR

Michael A. Babcock, Star Rte. 1, Box 428, Danbury, Wis. 54830

Filed Nov. 5, 1984, Ser. No. 668,561

Int. Cl.[4] A63B *69/18*

U.S. Cl. 272—97 **12 Claims**

1. Apparatus for practicing slalom waterskiing, comprising:

support means;

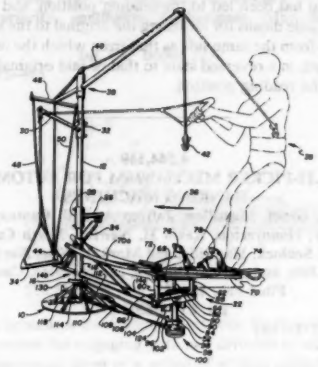
an elongated swing-arm mounted on the support means at a pivot point intermediate opposing ends of the arm for limited back and forth rotation between two extreme positions in a horizontal plane in response to effort by a practice skier;

pneumatic cylinder means extending between one end portion of the swing-arm and a fixed point spaced from the arm for dampening motion of the swing-arm in its initial movement during a swing toward one extreme position and for providing a pushing force in its later movement during such a swing, the ends of the cylinder being connected respectively to the arm and the fixed point by means of pivotal joints to accommodate the swinging movement of the cylinder in response to movement of the swing arm;

a pivotal ski mount carried at the other end portion of the swing-arm and adapted to pivot thereon between two extreme positions in a horizontal plane;

rotating means operably attached to the pivotal ski mount for rotating it from one extreme position to the other when the swing-arm moves from one of its extreme positions to the other, and

ski tow handle means connected to the apparatus above the



swing-arm at a location intermediate the two extreme positions of the swing arm whereby a practice skier on the ski mount may apply effort to the ski arm to impart motion thereto thereby simulating slalom waterskiing.

4,544,154

PASSIVE PROGRAMMABLE RESISTANCE DEVICE

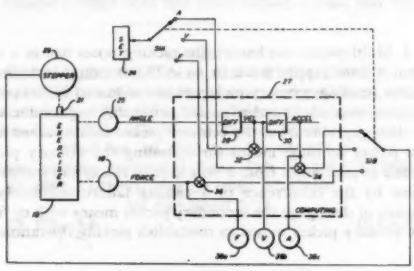
Gideon B. Ariel, Belchertown, Mass., assignor to Pepsico, Inc., Purchase, N.Y.

Continuation-in-part of Ser. No. 949,237, Oct. 13, 1978, Pat. No. 4,354,676. This application Apr. 26, 1982, Ser. No. 372,178

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.[4] A63B *21/24*

U.S. Cl. 272—129 **5 Claims**



1. A programmable resistance device comprising;

(a) a hydraulic cylinder;

(b) a piston mounted in said cylinder for movement by a force applied to the piston;

(c) a control valve for controlling the flow of hydraulic fluid from said cylinder as said piston moves and thereby controlling the amount of resistance provided to movement of the piston;

(d) means for measuring the pressure in said cylinder to provide a first output which is a function of force applied to said piston;

(e) means for providing a second output which is a function of the position of the piston;

(f) drive means for controlling said valve; and

(g) programmable means having as inputs said first and second outputs and providing a third output coupled as a

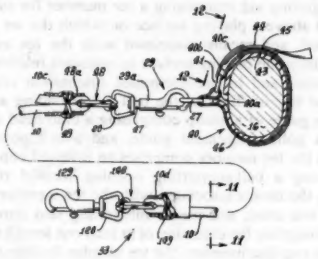
control input to said drive means, said programmable means including means to store an array of desired force values versus position; means responsive to said second output to select one of the stored values of force for comparison; and means to compare said selected value with said first output and to provide said third output in accordance with the difference therebetween.

4,544,155

EXERCISE DEVICE WITH STRETCHABLE ELASTOMERIC LINE

Craig Wallenbrock, Arcadia, Calif., and Leroy R. Perry, Jr., 1301 E. Rubio, Altadena, Calif. 91001, assignors to Leroy R. Perry, Jr., Altadena, Calif.

Filed Aug. 15, 1983, Ser. No. 523,181
Int. Cl.[4] A63B *21/04*
U.S. Cl. 272—136 **9 Claims**



1. Exercise apparatus, comprising

(a) an elongated, flexible, and yieldable stretchable elastomeric means having opposite ends,

(b) each end of said means being folded back upon itself so as to form a loop,

(c) two elongated flexible members, one at each said end, each member folded back on itself to define strands having the free ends thereof fastening the free end of the folded back portion of the elastomeric means so as to secure said loop formation and with the strands passing therethrough,

(d) each loop of the flexible members so formed being looped through a respective ring of a pivoting snap hook,

(e) and harness means in the form of a belt, said belt being folded back on itself with the folded back portion having loop means formed therewith, one free end of the belt having ring means with the other free end looped through the ring means and folded back on itself to be fastened by fastening means whereby the belt can be placed around different sized body members and adjustably fastened thereto by said fastening means and the loop means on said belt being releasably joined to either snap hook, with the other snap hook being releasably joined as desired to any exterior support structure.

4,544,156

TOY POOL TABLE COMPONENTS

Russell G. Rasmussen, Skokie; Alice A. Peinsipp, Westchester, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 3, 1984, Ser. No. 567,575
Int. Cl.[4] A63D *3/00*
U.S. Cl. 273—5 A **20 Claims**

1. Toy pool table components adapted to be attached to a piece of furniture having a top with a substantially horizontal upper planar surface and a periphery of finite thickness spaced from the floor by support means such that at least parts of the periphery are clear of the support means comprising:

a plurality of ball receiving pockets mountable adjacent a portion of the periphery;

each pocket having an opening for receiving a ball from the horizontal planar surface;

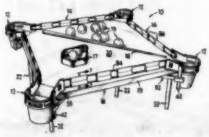
elastic boundary means extending between adjacent pockets for biasing the pockets into engagement with the top and for providing a resilient cushion for balls between the pockets;

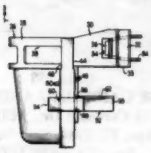
each pocket including a bracket having a portion with a lower surface for bearing upon the horizontal upper planar surface;

the bracket being generally "U" shaped with spaced apart, generally straight sections extending out from a bight section;

each of the straight sections having a free end opposite the bight section;

a portion of each of the straight sections adjacent the free





end overlying the horizontal upper surface and the bight portion projecting outboard of the periphery;

a member depending downwardly from each straight section;

a cantilevered arm carried by each member below the bracket for vertical movement of the arm along the member from a position in which the uppermost portion of the arm is proximate the lower surface of the bracket to any one of a plurality of selectable spaced positions for accommodating different thicknesses of the periphery of the top;

the arm having an inner end that extends beneath the horizontal planar surface and an opposed outer end;

the arm including an opening adjacent the outer end for receiving the member; and

means positioned within the opening engaging means on the member to control the vertical movement of the arm.

4,544,157

GOALKEEPER'S HOCKEY STOCK WITH BENT SHAFT

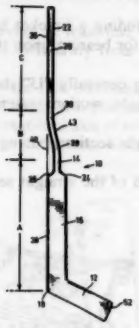
Martin D. Curtis, Bolton, Canada, assignor to Curtis Hockey Inc., Bolton, Canada

Filed Apr. 18, 1983, Ser. No. 486,126
Claims priority, application Canada, Mar. 10, 1983, 423259
Int. Cl.[4] A63B *59/12*
U.S. Cl. 273—67 A **10 Claims**

1. A goalkeeper's hockey stick comprising: a blade having a heel end; a shaft having a first end and a second end, said first end being connected to said heel end of said blade and said second end being free, said blade extending to one side of the shaft; said shaft having a widened lower portion near said first end and a narrowed upper portion near said free end, said widened portion being widened in the plane of the blade, said narrowed upper portion extending from the termination of said widened lower portion to said free end, said narrowed upper portion and said widened lower portion having rear surfaces

located on the opposite side of the shaft from which the blade extends;

said narrowed upper shaft portion including a bent region adjacent said widened lower shaft portion, said bent region causing the rear surface of said narrowed upper shaft portion above said bent region to be longitudinally aligned with the rear surface of said widened lower shaft portion and said heel of said blade.



4,544,158

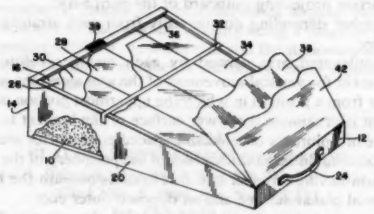
APPARATUS FOR CARRYING AND PLAYING GAMES

Peter P. Kilmonis, 26 Carousel Dr., Millbury, Mass. 01527

Filed Apr. 27, 1984, Ser. No. 604,732

Int. Cl.[4] A63F *1/10*

U.S. Cl. 273—150 **12 Claims**



1. A game apparatus comprising a core of light-weight, relatively rigid nature, said core including back and rear edges, top and bottom surfaces, and sides,

the top and bottom surfaces being at an acute angle, these surfaces diverging from a relatively narrow front edge to a relatively wider rear edge,

a flexible cover permanently secured to the front edge and temporarily securable to the rear edge to selectively cover or uncover the top surface,

a flexible member on the top surface under the cover and secured to the front edge and extending to the rear edge, said flexible member providing a support for throw-away game sheets,

a transparent sheet under the flexible member, means forming access to the space under the transparent sheet to insert game sheets thereunder so that they are visible through the sheet,

means to support the game cards under the transparent sheet in close proximity thereto, an erasable marker to mark the transparent sheet to indicate items on the game cards thereunder.

4,544,159

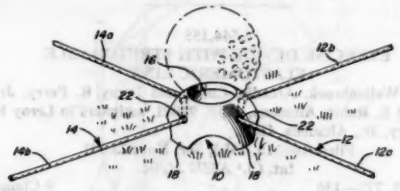
GOLFING AID

Paul S. Sells, 719 Shady Dr., Chattanooga, Tenn. 37412

Filed Mar. 25, 1983, Ser. No. 479,032

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—183 A **1 Claim**



1. A golfing aid comprising a tee member for supporting a golf ball above a playing surface on which the tee member is positioned, and means associated with the tee member for laying along the playing surface in extended relation from the tee member and in predetermined orientation relative to a proposed line of flight of the ball for providing at least one elongate guide of a group comprising a club head swing path guide, a golfer alignment guide, and a ball position guide wherein the tee member comprises an inverted cup-like member having a ball-supporting opening formed therein and wherein the means associated with the tee member comprises at least one cord, and means integrating said cord with the cup-like member for extension of at least one length of the cord from the cup-like member, the tee member further including a tube mounted with a friction fit in said opening for raising and lowering movement therein to provide an alternative adjustable height golf ball support, wherein the tee member has four circumferentially spaced openings, and the means associated with the tee member comprises a pair of cords, each cord being wound in a pair of the openings in pull-through manner bypassing the tube, so as to provide a pair of cord lengths which may be extended from the tee member at different angles.

4,544,160

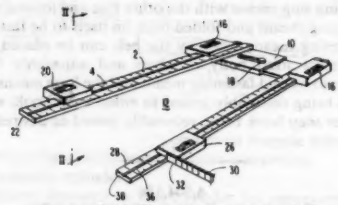
PRACTICE DEVICE FOR PUTTING STROKES

Robert A. Miner, 31 Pine Arbor La., Vero Beach, Fla. 32960

Filed Apr. 16, 1984, Ser. No. 601,088

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—186 C **5 Claims**



1. A golf putting practice device comprising a first elongated rigid strip member having longitudinal measurement indicia on the top surface thereof, a second elongated rigid strip member substantially identical to said first elongated rigid strip member, adjustable spacer means connected to said first and second elongated rigid strip members at one end thereof to hold said first and second strip members in spaced apart parallel relation to each other while defining therebetween a rectangular putter stroke area, a first rectilinear plate member slidably carried on said first strip member for sliding movement towards and away from said adjustable spacer means and first locking means for selectively locking said first rectilinear plate member to said

first strip member at a desired position, a second rectilinear plate slidably carried on said second strip member for movement toward and away from said adjustable spacer means and second locking means for selectively locking said second rectilinear plate member to said second strip member at a desired position and a bar secured to said second rectilinear plate member and extending outwardly away from said rectangular putter stroke area perpendicular to said second strip member for locating the forward foot of the user perpendicular to said second strip member.

4,544,161

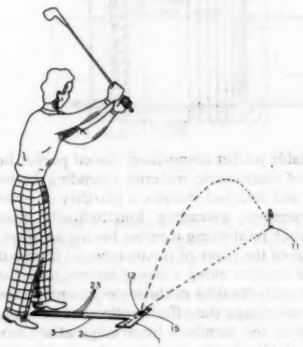
TRAINING AID FOR HITTING GOLF BALL

Fred W. Guendling, Jr., 19904 Center St., Box 443, Mokena, Ill. 60448

Continuation of Ser. No. 490,817, May 2, 1983, abandoned. This application Jul. 19, 1984, Ser. No. 632,501

Int. Cl.⁴ A63B *69/36*

U.S. Cl. 273—187 A **6 Claims**



1. A golf ball positioning device, comprising a unitary integrally formed planar member adapted to lie flat on the ground in substantially the same plane as the surface of the ground throughout its entire surface area, a plurality of spaced apart holes therein aligned in a first line which extends in the direction of intended flight of a golf ball when said positioning device is laid on the ground in position for use, including a first hole at one end of said line and a last hole at the other end of said line, a golf tee for placement through a selected one of said holes and into the ground when said positioning device is laid thereon, a golf ball for placement on said golf tee, a plurality of spaced apart marks on the surface of said planar member aligned in the direction of where the golfer will stand when in position to swing relative to where the said golf ball is placed at such time, said marks being aligned in a second line which extends in a direction which is substantially normal to the direction in which said holes are aligned, said spaced apart holes aligned in said first line which extends in one direction and said spaced apart marks aligned in a said second line which extends in a second direction which is normal to said first direction and being permanently fixed relative to each other in such a way that an in line extension of said second line intersects said first line at a point thereon between said first hole and said last hole, said planar member including a flat upper surface which is completely planar throughout its entire surface area, said planar member being of a rigid shape retaining material in the form of a T-shaped member having a cross-arm and an elongated leg extending from the midpoint of said cross-arm and normal thereto, said T-shaped member having a completely planar upper surface wherein the upper surfaces of said cross-arm and of said elongated leg are co-planar, said cross-arm and said elongated leg being integrally joined and permanently fixed relative to each other, said spaced apart holes being formed in said cross-arm, said spaced apart marks being formed on said elongated leg, said plurality of spaced apart holes includes at least one reference positioning hole as a normal position of reference, a first plurality of positioning holes positioned forwardly of said reference positioning hole in the said direction of intended flight, and a second plurality of positioning holes positioned rearwardly of said reference positioning hole also in the said direction of intended flight, said positioning holes having a diameter large enough to accept said golf tee therethrough.

4,544,162

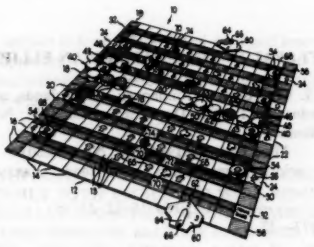
BOARD GAME UTILIZING ARTICULATED PLAYING PIECES

Michael J. Ferris; Paul H. Wise, both of Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 4, 1983, Ser. No. 520,332

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—242 **13 Claims**



1. A board game comprising:

a planar game board with turning means defining a serpentine path of contiguous spaces consisting of generally parallel, spaced apart, path rows with ends and generally semicircular alternating turns connecting ends of adjacent path rows;

at least one articulated token moveable on the game board;

the token having a plurality of segments including a forward segment and a rearward segment with joint means connecting each segment to each adjacent segment;

each segment being a flat piece having two sides and the joint means permitting each segment to be changed from one side to the other side independently of the other segments; and

the turning means including disks disposed adjacent the inside of each semicircular turn and projecting upwardly from the planar game board to provide a bearing to facilitate turning of the token from one path row to an adjacent path row.

4,544,163

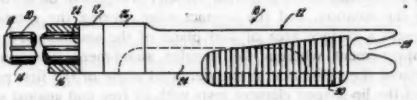
ARROW NOCK

John P. Scanlon, 4366 Bishop, Detroit, Mich. 48224

Filed Mar. 20, 1985, Ser. No. 713,826

Int. Cl.⁴ F41B *5/02*

U.S. Cl. 273—416 **11 Claims**



10. An arrow nock comprising: a cylindrical body member having a diameter equal to the diameter of the arrow shaft, a plug element extending axially of said cylindrical body mem-

ber for insertion into the end of a tubular arrow shaft and to hold said body member in abutting relationship to the end of an arrow shaft, a grip portion extending axially in the opposite direction from said shaft, said grip portion including a flattened portion having a thickness less than the diameter of said body member, said grip portion merging with said body member by a tapered portion, a notch at the end of said grip portion to receive a bow string, pad portions disposed on the top and bottom of said flattened portion and adjacent said notch, said pad portions being provided with friction surfaces for gripping between the index and middle finger of an archer drawing a bow string, said pad portions being elevated above said flattened portion and projecting to one side thereof, said fingers of an archer being gradually spread by said tapered portion upon release of the nock by an archer to clear said pad portions and the surfaces of said nock upon release of an arrow.

4,544,164

SHAFT SEAL IN THE SHAPE OF AN ELLIPTICAL FUNNEL

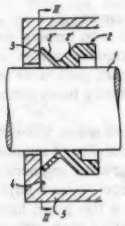
Mathias J. M. Cuijpers, Eindhoven, Netherlands, assignor to SKF Industrial Trading Development Co. B.V., Nieuwegein, Netherlands

Filed Dec. 21, 1984, Ser. No. 684,601

Claims priority, application Netherlands, Jan. 26, 1984, 84/00241

Int. Cl.[4] F16J *15/32, 15/36*

U.S. Cl. 277—25 **5 Claims**



1. In a seal between the circular cylindrical circumferential plane of a first part, in particular a shaft, and a plane of a second part perpendicular to the cardioid line of this circumferential plane, whereby one of these parts can rotate around said cardioid line, with a generally annular sealing element of a resilient material, consisting of an annular attachment for attaching the sealing element to the first part and a circling lip-shaped element built in and extending at an angle from the first part, whose free end rests resiliently and in accordance with an essentially linear contact edge against said plane of the second part, and which is shaped in such manner that when one of the parts rotates, points of the contact edge possess a velocity vector which cuts the contact edge in these points, so that at these points a velocity component is obtained which is perpendicular to the principal velocity component on account of the rotation, and the contact edge, during the rotation, covers a surface area of said plane of the second part, the improvement wherein the annular attachment is mounted around the cylindrical circumferential plane of the first part, and the lip-shaped element rests with its free end against said plane of the second part-perpendicular to the cardioid line-of the first part, whereby this lip-shaped element is shaped in such manner that its free end comes into contact with said plane of the second part according to an oval.

4,544,165

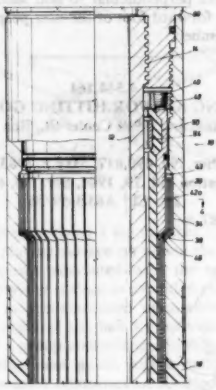
INFLATABLE PACKER

Malcolm G. Coone, Houston, Tex., assignor to Xenpax, Inc., Houston, Tex.

Filed May 16, 1983, Ser. No. 494,962

Int. Cl.[4] E21B *33/127*

U.S. Cl. 277—34 **17 Claims**



1. An inflatable packer comprising spaced packer heads, an inner sleeve of elastomeric material extending between the packer heads and attached thereto, a plurality of overlapping reinforcing members extending longitudinally from each packer head, each reinforcing member having an offset section that is bent out of the plane of the member to form a dihedral angle with the member along a line of intersection that makes an acute angle with the sides of the member, and means on the packer heads to engage the offset sections of the reinforcing members to hold the members from longitudinal movement relative to the packer heads.

4,544,166

BREATHER FOR ELECTRICAL APPARATUS

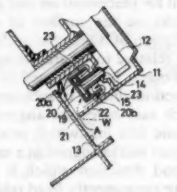
Kazuo Karasawa, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 18, 1984, Ser. No. 601,600

Claims priority, application Japan, Apr. 28, 1983, 58-65809

Int. Cl.[4] F16J *15/44*

U.S. Cl. 277—57 **5 Claims**



1. In a wiper motor for a vehicle, said wiper motor being accommodated in a case, a breather configuration comprising:

an installation hole formed in said case for bommunicating the interior of the case to atmosphere;

a breather outlet comprising a shaft having an air passage hole at the center thereof said shaft projecting outwardly from said installation hole and including a flange spaced from said installation hole, said flange having at least one air passage notch at a periphery thereof; and

a breather cap having a side wall attached to the periphery of the flange of said breather outlet, said side wall extending past said flange and leaving said notch open to permit

air to flow through said notch between said flange and said side wall, said cap also including an end wall connected to said side wall and spaced from an extreme end of said shaft, said cap and said flange being oriented to provide an air flow labyrinth,

thereby preventing water from being directed into the case and providing a ventilation path for said case.

4,544,167

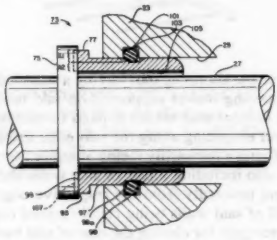
FACE SEAL WITH RESILIENT PACKING RING FORCING FACE RINGS TOGETHER

Claude Giroux, Azle, Tex., assignor to Texas Turbine, Inc., Azle, Tex.

Division of Ser. No. 387,504, Jun. 11, 1982, Pat. No. 4,477,223. This application Aug. 13, 1984, Ser. No. 639,719

Int. Cl.⁴ F16J *15/34*

U.S. Cl. 277—82 **9 Claims**



1. An improved mechanical seal for sealing a rotating shaft extending through a bore, comprising in combination:

a rotating ring having a rotating face and carried by the shaft for rotation therewith;

a nonrotating ring having a nonrotating face that sealingly engages the rotating face, and having a cylindrical portion carried within the bore;

the cylindrical portion having an annular recess that combines with an annular groove formed in the bore to define a cavity; and

a resilient packing ring carried within the cavity;

the recess being axially offset from the groove, deforming the packing ring and causing the packing ring to exert a force on the nonrotating ring against the rotating ring.

4,544,168

SEAL BETWEEN ROTATING CONCENTRIC ELEMENTS

Rüdiger Hans, Niederwerrn, and Wolfgang Friedrich, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

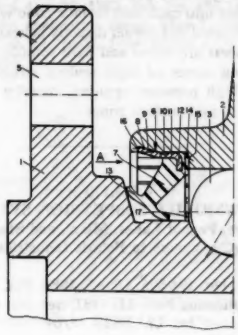
Continuation of Ser. No. 647,991, Sep. 6, 1984, abandoned, which is a continuation of Ser. No. 507,559, Jun. 24, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,497

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 8218351[U]

Int. Cl.⁴ F16J *15/32, 15/34*

U.S. Cl. 277—84 **16 Claims**

1. In a sealing arrangement for inner and outer rings that are rotatable with respect to one another, comprised of a holding ring having circumferentially distributed spring fingers on its end that are positioned to snap into and engage an annular groove in the surface of a bore in the outer ring upon the application of axially inward pressure to the holding ring; the improvement wherein the holding ring includes said spring fingers on its axially outwardly directed end and a centering portion on its axially inwardly directed end, said centering portion supporting said spring fingers and radially engaging said bore surface adjacent said groove and being radially supported in said bore of the outer ring adjacent said annular groove, and wherein a seal formed as a unit with said ring has an axially clamped mounting section clamped with compression between the centering portion and a radially extending inner shoulder of the outer ring adjacent the bore of the outer ring, said seal having a sealing section extending from said



mounting section to form a sliding seal with said inner ring, the radially supported fit between said bore and said centering portion positioning said seal concentrically with the rotating axis of said machine elements.

4,544,169

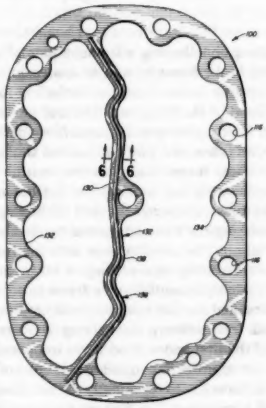
MANUFACTURED PRECOMPRESSED GASKET ASSEMBLY WITH EMBEDDED WIRE RING AND LOCALLY DENSIFIED SHEET MEMBERS

David A. Cobb, Hazelcrest, and Frank L. Miszczak, Frankfort, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed Jun. 20, 1984, Ser. No. 622,719

Int. Cl.⁴ F16J *15/08;* **B65D** *53/00*

U.S. Cl. 277—235 B **6 Claims**



1. A manufactured high temperature resistant head gasket assembly especially adapted to accommodate to the relatively high temperatures of an air cooled internal combustion engine comprising a first metallic sheet member and a second metallic sheet member of substantially the same shape and form, each defining a plurality of openings, said openings comprising at least two bolt holes through which bolts are adapted to pass and at least one high pressure opening for surrounding a high pressure combustion zone to be sealed, said metallic sheet members each defining confronting surface zones adjacent said high pressure opening, and a metallic wire disposed and sand-

wiched between said surface zones closely adjacent to the high pressure opening, means securing said wire and sheet members together, and said gasket assembly during manufacture and prior to use being precompressed with said wire being significantly embedded into each said surface zone with said surface zones being densified and harder directly beneath the wire than the metallic sheets are dense and hard remote from the wire, whereby sealing zones of high sealing stress are provided adjacent said high pressure opening, thereby to provide an improved seal at said surface zones.

4,544,170

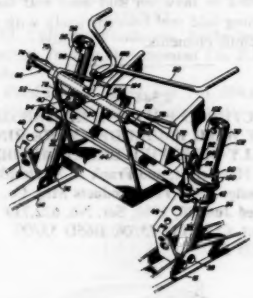
SNOWMOBILE SUSPENSION SYSTEM

Russell L. Ebert, Pequot Lakes, Minn., and Stanley G. Hayes, Horicon, Wis., assignors to Polaris Industries, Inc., Roseau, Minn.

Division of Ser. No. 194,596, Oct. 6, 1980, Pat. No. 4,431,078. This application Nov. 12, 1982, Ser. No. 440,904

Int. Cl.⁴ B62B *17/04*

U.S. Cl. 280—21 R **7 Claims**



1. In a snowmobile having a frame, a pair of skis suspended from the front of the frame by a front suspension including first and second upright struts, the struts including first and second outer tubes fixed to the frame and first and second inner tubes, respectively, telescopically and rotatably mounted in the outer first and second tubes, and first and second shock absorber and spring assemblies, respectively located within the first and second upright struts and mounted to act between the frame and the inner tubes, respectively, and including first and second springs biasing the first and second inner tubes to normally extended positions, the combination with the front suspension of a stabilizer assembly comprising: a horizontal, transverse torsion bar rotatably mounted to the frame in adjacent relationship to the first and second upright struts; and first and second linkage means respectively connecting the first and second inner tubes of the first and second struts to opposite ends of the torsion bar for transferring upward movement of the inner tubes to the torsion bar to torsionally deflect the latter to resist such upward movement, the first and second linkage means respectively including first and second sleeves respectively received on the first and second outer tubes, first and second guide means respectively associated with the first and second outer tubes and first and second struts and guiding the first and second sleeves along the length of the struts while preventing rotation thereabout, first and second lost motion connection means connecting the first and second sleeves to respective upper end portions of the first and second inner tubes for telescopic but not rotatable motion therewith, and first and second motion transfer linkages respectively connected between the first and second sleeves and the opposite ends of the torsion bar.

4,544,171

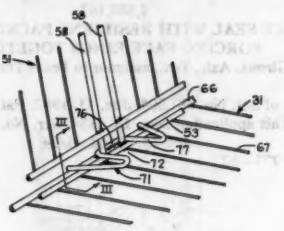
ANTI-SWAY CLIP FOR REAR GATE OF SHOPPING CART BASKET

Guy Kellogg, Battle Creek, Mich., assignor to United Steel & Wire Company, Battle Creek, Mich.

Filed Oct. 21, 1983, Ser. No. 544,317

Int. Cl.⁴ B62B *11/00*

U.S. Cl. 280—33.99 A **7 Claims**



1. In a nestable shopping cart having a wheeled base, and an upwardly opening basket supported on said base, said basket including a bottom wall which is fixed to said base and has a cross member extending along the rear edge thereof, said cross member defining a forwardly facing abutment surface thereon, said basket also including a pair of side walls and a front wall which extend upwardly from the respective edges of the bottom wall, all of said walls being rigidly joined together, and a swingable rear gate for closing the rear of said basket, said rear gate extending between the side walls and having means associated with the upper end thereof for hingedly supporting same relative to said side walls for permitting the rear gate to be moved between a closed position wherein it closes off the rear of the basket and an open position wherein the gate swings inwardly and upwardly relative to the basket to permit nesting between baskets of two like carts, said rear gate having structure at the lower free end thereof which abuts said cross member when the gate is in said closed position, said gate also having rod means disposed substantially at the center thereof and extending vertically between the upper and lower edges thereof, the improvement comprising anti-sway means fixedly mounted on the bottom wall of said basket adjacent the center of the rear edge thereof for sidewardly confining said center rod means when said gate is in said closed position, said anti-sway means including a U-shaped part having a bight portion which is fixed to said cross member adjacent the middle thereof, said bight portion extending between and being fixedly connected to a pair of substantially parallel leg portions which define a slot therebetween which opens forwardly toward the front wall of the basket, said leg portions projecting forwardly only a small extent away from said cross member, said leg portions at their forward ends being rounded outwardly away from one another to define a widened flared opening at the open outer end of the slot, and said center rod means being closely sidewardly confined within said slot when said gate is in said closed position.

4,544,172

WHEELED DEVICES FOR CARRYING SAIL BOARDS

Armand Poulouin, 2, Chemin des Bruyères Kérity, 22500 Paimpol, France

Filed Jun. 22, 1983, Ser. No. 506,721

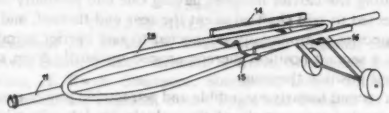
Claims priority, application France, Jun. 25, 1982, 82 11784

Int. Cl.⁴ B60P *3/10*

U.S. Cl. 280—47.13 B **20 Claims**

1. A wheeled device for for carrying sail boards, said device comprising a support on which a sail board float is set, a fast coupling system comprising a first generally U-shaped coupler facing downwardly, a second generally U-shaped coupler facing upwardly, said first and second couplers being aligned to receive a sail board mast which sets the sail board mast

below a position for receiving the sail board float set on the said support, wherein one of the said two couplers blocks the mast from moving downwardly and from moving sideward



along a rather long portion and the other of said two couplers blocking the mast from moving upwardly (or downwardly) without providing sideward blocking, and a spaced parallel pair of wheels mounted to roll along paths parallel to said mast.

4,544,173

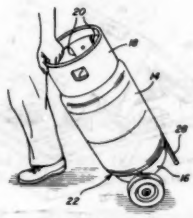
SELF-STORING LPG TANK CART

David S. Kellermyer, 919 Wilhelm, Defiance, Ohio 43512

Filed Dec. 19, 1983, Ser. No. 563,179

Int. Cl.[4] B62B *3/10, 1/26*

U.S. Cl. 280—47.33 **3 Claims**



1. An LPG tank including a shouldered diametrically reduced lower end, a cart for trailing said tank including a rigid cylindrical ring of an inside diameter snugly receiving said diametrically reduced end of said tank therethrough with the shoulder of said tank abutted against said ring, support leg means carried by a first peripheral portion of said ring and projecting generally axially of said ring away from said tank, a pair of support arms supported from second and third peripherally spaced portions of said ring substantially equally and oppositely angularly spaced from said first portion and spaced slightly on the side of a diametric plane of said ring remote from said first portion and disposed normal to a radial plane generally centered relative to said leg means, said arms also projecting generally axially outwardly from said ring away from said tank, the outer free ends of said arms including support wheels journalled therefrom for rotation about generally aligned axes paralleling said diametric plane, said axes being spaced outward of the free end of said diametrically reduced end of said tank, the upper end of said tank including a shoulder defining diametrically reduced protective sleeve of an axial extent greater than the axial extent of said diametrically reduced lower end and over which said ring of said cart is snugly receivable to a position with the shoulder defined by said sleeve abutted by said ring when said cart is inverted, the spacing between said ring and those peripheral portions of said wheels remote from said ring being less than the axial extent of said sleeve, whereby when said cart is positioned on said sleeve with said ring abutted against the shoulder defined by said sleeve, no portions of said cart, including the wheels thereof, project outward beyond the free end of said sleeve.

4,544,174

DRIVING MECHANISM FOR VEHICLE PROPELLED BY HUMAN MUSCLE POWER

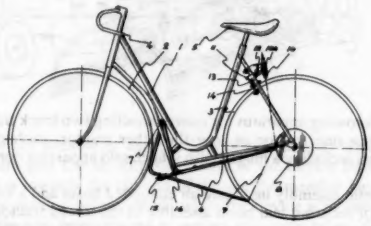
Jecheskel Davidovitch, 22 Avtalion St., Ramath Gan, Israel

Filed Apr. 25, 1983, Ser. No. 488,117

Claims priority, application Israel, May 7, 1982, 65711

Int. Cl.[4] B62L *3/04*; B62M *1/04*

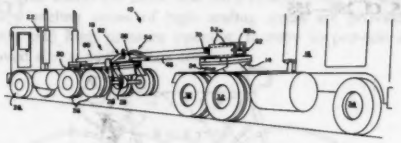
U.S. Cl. 280—255 **7 Claims**



1. In a vehicle of the kind propelled by human muscle power and which comprises a frame and a driven wheel mounted on said frame, a driving mechanism including two backwardly free wheeling grooved pulleys which are concentrically fixed on the two sides of said driven wheel, an intermediate grooved idler, mounted on said frame, a single driving cord (or any other bendable element) slung about the said intermediate idler and partially wound around said grooved pulleys, two swingable elongated pedals of a length greater than a human foot to which pedals the two ends of said driving cord are connected, and a brake system which is actuated when said both pedals are depressed simultaneously, and which operates by means of the said intermediate idler being attached to a spring loaded swingable arm, which is connected with a brake mechanism.

2. Wheeled apparatus comprising a frame having a first end portion and a second end portion and a pair of opposite sides extending in the first end portion-second end portion direction, a driven wheel mounted on the second end portion of said frame and having a pair of opposite sides, said driven wheel being arranged to rotate in the forward direction and the rearward direction, means mounted on said frame for driving said driven wheel, said means comprises a pair of operating members elongated in the first end portion-second end portion direction of said frame and each said operating member having a first end and a second end, the first end of each said operating member being pivotally mounted to said frame at the first end portion thereof and extending toward the second end portion, a pair of rotary elements mounted coaxially with said driven wheel each located on one of the opposite sides of said wheel, said rotary elements being coupled to rotate with said driven wheel in the forward direction thereof and to freewheel in the rearward direction thereof, and an elongated flexible drive member having a first end and a second end and being connected at the first end thereof to one of said operating members at a location spaced in the elongated direction of the one of said operating members from the first end thereof and at the second end thereof to the other one of said operating members at a location spaced in the elongated direction of the other one of said operating members from the first end thereof, and intermediate said first and second ends said flexible drive member is in driving engagement with said rotary elements, said operating member being arranged to be operated by a user by contacting said operating members at different positions spaced between the first end thereof and the connection thereof to said flexible drive member whereby the distance between the first end of said operating member and the point of contact by the user determines the speed and power applied to said driven wheel via said flexible drive member.

4,544,175
TRUCK TRACTOR TOWING APPARATUS
Alvin I. Hubert, 176 S. State St., Sparta, Mich. 49345
Filed Sep. 30, 1983, Ser. No. 537,802
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—402 14 Claims



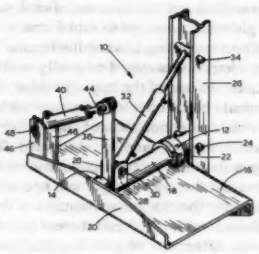
1. A towing apparatus for interconnecting two truck tractors enabling one tractor to tow the other tractor, each of the tractors including a hinged fifth wheel, said apparatus comprising:

a beam assembly including an elongated beam and a kingpin for securing said beam assembly to the towed tractor fifth wheel, said beam assembly further including means for securing said beam to the towed tractor at a location remote from the fifth wheel to fixedly secure said beam to the towed tractor, said beam extending rearwardly and downwardly from the tractor and terminating in a free end;

a ramp assembly including an elongated ramp and a kingpin for securing said ramp assembly to the towing tractor fifth wheel for pivotal movement therewith, said ramp extending rearwardly and downwardly from the fifth wheel, said ramp supporting said free beam end for sliding movement therealong, whereby the rear wheels of the towed tractor can be lifted by backing the towing tractor toward said towed tractor causing said beam assembly and towed tractor to be lifted by said ramp assembly; and

interlock means for preventing said beam and ramp from becoming disengaged.

4,544,176
TRACTOR MOUNTED HYDRAULIC CONTROL MECHANISM FOR AN EARTH WORKING TOOL
James L. Helmick, Estherville, Iowa, assignor to Shaver Manufacturing Co., Graettinger, Iowa
Filed Nov. 14, 1983, Ser. No. 550,776
Int. Cl.[4] B60D *3/00*; E21B *15/04*
U.S. Cl. 280—481 4 Claims



1. A control mechanism for selectively positioning a vehicle mounted upright tool relative to the supporting terrain, said mechanism comprising:

(a) a horizontal base plate rigidly mounted adjacent the front end of the vehicle;

(b) a shaft rotatably mounted on the base plate for rotation about an axis extended longitudinally of the vehicle, having a rear end and a front end located forwardly of said base plate;

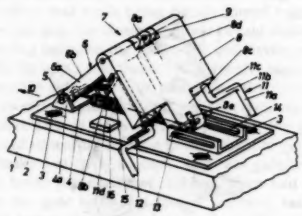
(c) an upright carrier member for said tool pivotally connected at a first position thereon to the front end of said shaft for tilting movement longitudinally of the vehicle;

(d) a first linearly extendible and retractable power means extended longitudinally of the vehicle for longitudinally tilting the carrier member having one end pivotally connected to said shaft adjacent the rear end thereof, and an opposite end pivotally connected to said carrier member at a second position thereon spaced upwardly from said first position thereon,

(e) a second linearly extendible and retractable power means extended transversely of the vehicle for laterally tilting the carrier member having one end pivotally connected to said shaft, rearwardly of said first power means, and the other end thereof pivotally mounted on said base plate; and

(f) means on the vehicle for concurrently and separately operating said first power means and said second power means.

4,544,177
SKI BRAKE
Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland
Filed Sep. 3, 1982, Ser. No. 414,701
Claims priority, application Austria, Sep. 18, 1981, 4044/81
Int. Cl.[4] A63C *7/10*
U.S. Cl. 280—605 6 Claims



1. A ski brake, comprising a pedal having first and second parts, and a braking arm having a first section which extends parallel to a longitudinal axis of the ski, is rotatably supported on said first part of said pedal, and can be rotated by means which includes an extension provided on said braking arm, said pedal parts being pivotally connected with one another and forming, together with said braking arm, a braking mechanism, said first pedal part being supported for pivotal movement on a movably supported swivel axle which is biased by a spring, which extends substantially at a right angle with respect to the longitudinal axis of the ski, and which is slidably supported in a slide bearing, said slide bearing extending in the direction of the longitudinal axis of the ski and being supported by a ski-fixed holding plate, said second part of said pedal being pivotally supported on a ski-fixed axle which extends substantially at a right angle with respect to the longitudinal axis of the ski and which supports one end of said spring which biases said swivel axle; wherein said second pedal part includes two spaced, parallel arms and a cover plate thereon; wherein said first pedal part is substantially wider than said second pedal part, has a recess at one end in which ends of said spaced, parallel arms are pivotally supported, and has an extension at the other end through which said swivel axle guided in said slide bearing extends, said extension having a slot therein and an end of said spring extending into said slot; wherein said braking arm includes a second section which is generally parallel to and spaced radially from said first section, rotation of said frst section causing said second section to move between first and second positions in which it is respectively spaced laterally inwardly and outwardly of a side wall of the ski; and including a further spring which is cooperable with said braking arm and

which yieldably urges rotation of said first section thereof in a direction corresponding to movement of said second section toward its second position.

4,544,178

COLLAPSIBLE PUSH CHAIR

Abdelraouf M. Al-Sheikh, Loughborough, England; Sakir T. Avci, Daire, Turkey; Kenneth S. Kelso, St. Albans, England; Seng H. Kwek, Singapore, Singapore; Lionel B. McBean, Birmingham, England; Stuart Pugh, and Douglas G. Smith, both of Loughborough, England, assignors to Andrews Maclaren Limited, Northampton, England

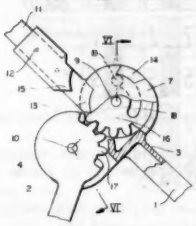
PCT No. PCT/GB83/00098, § 371 Date Nov. 30, 1983, § 102(e) Date Nov. 30, 1983, PCT Pub. No. WO83/03393, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 31, 1983, Ser. No. 561,594

Claims priority, application United Kingdom, Mar. 31, 1983, 8209556

Int. Cl.⁴ B62B *7/08*

U.S. Cl. 280—642 **6 Claims**



1. A collapsible push chair in which two transversely connected side frames each comprise:

first and second legs (1 and 2) respectively provided with adjacent first ends (3 and 4) and with second ends (5 and 6);

pivot means (7 to 10) providing articulation between the adjacent first ends (3 and 4) of the first and second legs (1 and 2); and

a handle shaft (11);

characterised in that:

the handle shaft (11) is pivotally connected to said pivot means (7 to 10) for movement between a first position, in which the handle shaft (11) extends away from the first leg (1), and a third position, laterally adjacent the first leg (1), respectively on opposite sides of a second position in which the handle shaft (11) extends away from the second leg (2);

locking means (12 to 15) are provided for releasably locking the handle shaft (11) in said first and second positions;

drive means (16 and 17) interconnecting the handle shaft (11) and at least one of the first and second legs (1 and 2) for relative movement of the first and second legs (1 and 2) so that when the handle shaft (11) is in said third position the first leg (1) is laterally adjacent the second leg (2); and

lost motion means (18 and 19) permitting movement of the handle shaft (11) from the first position to the second position without relative movement between the first and second legs (1 and 2).

4,544,179

CLIMBING DEVICE FOR SKIS

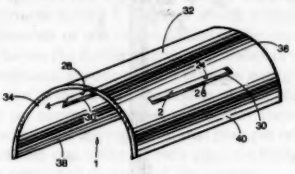
Clarence Boudreau, General Delivery, Penny, British Columbia, Canada (V0J 2K0)

Filed Oct. 7, 1983, Ser. No. 540,168

Int. Cl.⁴ A63C *7/08*

U.S. Cl. 280—604 **9 Claims**

1. A climbing device for a ski comprising a member with two ski receiving apertures therethrough, the member having a deformed shape where the apertures are sufficiently aligned to permit the member to slidably fit over a tail end of the ski to a position rearwards of a binding on the ski, the member being resiliently biased away from the deformed shape towards a second shape where the apertures are insufficiently aligned to



permit the slidable fit and portions of the member about the aperture grip the ski to resist sliding of the device from said position towards the tail end of the ski, the member having a part projecting below the ski when the device is in said position, the part being shaped to project into snow below the ski.

4,544,180

TRAILING LINK TYPE BEAM SUSPENSION

Hideki Maru, Wako, and Tetsuro Mitsui, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,463

Claims priority, application Japan, Feb. 1, 1983, 58-15147

Int. Cl.⁴ B60G *21/04*

U.S. Cl. 280—689 **17 Claims**

14. In a trailing link type beam suspension comprising:

an axle having first and second ends at each of which a wheel is connected rotatably;

a first trailing arm having one end fixed to the first end of said axle beam and the other end pivotably connected to the chassis of a vehicle; and

a second trailing arm having one end rotatably connected to the second end of said axle beam and the other end pivotably connected to said chassis;

the improvement, wherein

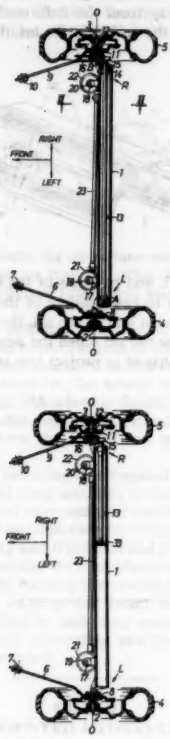
the axle beam is tubular and hollow and comprising

stabilizer means in said hollow axle beam for resisting relative rotation thereof due to differential up and down movement of the wheels,

said stabilizer means including

a torsion bar having first and second ends, means securing one of the ends of the torsion bar to the axle beam,

means rotatably supporting the second end of the torsion bar from the axle beam, and



a link rotatably connecting said torsion bar to said second trailing arm.

4,544,181

IDENTIFICATION CARD

Thomas Maurer, Munich; Wolfgang Gauch, Otterfing, and Ludwig Devrient, Vaterstetten, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 122,964

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2907004

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—74 **8 Claims**

1. In a multilayer identification card, comprising two cover sheets at least one of which is transparent and an opaque card core laminated between the cover sheets and provided with visually perceptible information defined by patterns, letters, numbers and/or pictures, the improvement comprising the presence of said information in the card core in the form of localized, visible, thermally and irreversibly degraded core portions formed in said core by means of a laser beam traversing the transparent cover sheet subsequent to core lamination to said cover sheet, whereby the information is also formed in said cover sheet in register with and simultaneously with the information in the card core.

4,544,182

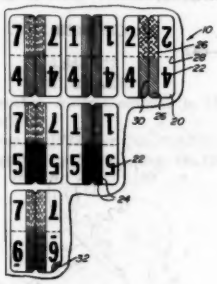
REVERSIBLE NUMERIC COLOR-CODED LABELS

Robert P. Spring, Box 306, Buckingham, Pa. 18912

Filed Nov. 10, 1983, Ser. No. 550,453

Int. Cl.⁴ B42F *21/00*

U.S. Cl. 283—81 **4 Claims**



1. A file folder label, comprising:

(a) a central foldline;

(b) a front portion on one side of the foldline;

(c) a back portion on the opposite side of the foldline;

(d) numeric digits on the front portion arranged in a vertical column parallel to the foldline in a given order, top to bottom;

(e) numeric digits on the back portion each individually identical to the digits on the front portion and arranged likewise in a vertical column parallel to the foldline in the same order, top to bottom, as the digits on the front portion, each digit on the back portion being rotated 180 degrees with respect to its corresponding digit on the front portion.

4,544,183

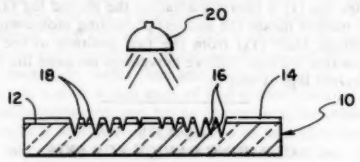
IDENTIFICATION CARD WITH A RADIANT ENERGY REACTIVE COATING

Dean B. Parkinson, Redwood City, Calif., assignor to Computer Identification Systems, Calumet City, Ill.

Filed Aug. 5, 1983, Ser. No. 520,667

Int. Cl.⁴ B42D *15/00*; B05D *3/06*

U.S. Cl. 283—85 **8 Claims**



1. A multilayered identification card comprising:

a base layer having a first color, the base having a plurality of depressions of varying depths engraved therein to define an engraved image in the base; and

a color-changeable layer disposed on and bonded to selected

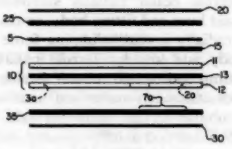
regions of the base layer, the color changeable layer initially having a second color, which color is permanently changeable, upon exposure to radiant energy for a specified period of time, to a third color which contrasts with the first color.

4,544,184

TAMPER-PROOF IDENTIFICATION CARD AND IDENTIFICATION SYSTEM

Robert F. Freund, Centerville, and Daniel R. Valentine, Dayton, both of Ohio, assignors to Freund Precision, Inc., Dayton, Ohio

Filed Jul. 7, 1983, Ser. No. 511,465
Int. Cl.⁴ B42D *15/00*; G09F *3/00*; B41M *3/14*
U.S. Cl. 283—94 **6 Claims**



1. A tamper-proof and wear-resistant identification card comprising:

a support member having a front surface and a rear surface;

a recording means on one of said surfaces for storing encoded data;

a first transparent layer overlying said front surface of said support member and having a first surface;

a transparent bond layer attaching said first surface to said front surface of said support member;

a second transparent layer overlying said rear surface of said support member and said recording means;

a second transparent bond layer bonding said second transparent layer to said rear surface of said support member; and

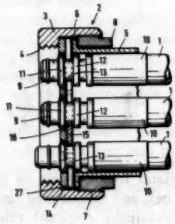
an invisible optically-readable code imprinted at the bond layer between one of said transparent layers and said support member.

4,544,185

HYDRAULIC COUPLING DEVICE

Walter Weirich, Dortmund, and Bernd Peters, Dülmen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Luaen, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,447
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235554
Int. Cl.⁴ F16L *39/00*
U.S. Cl. 285—137 R **14 Claims**



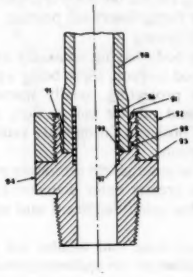
1. A hydraulic coupling device for a multi-line hose comprising a plurality of hydraulic lines (**1**) adapted to be housed within a flexible sheath, the coupling device comprising a casing (**3**), a plurality of plug pins (**9**) housed within the casing, and means for holding the plug pins within the casing, the plug pins each being connected to a respective line of the hose, the holding means comprising a holder (**15**), a retainer (**14**), and a sleeve (**5**), wherein each of the plug pins includes a pair of longitudinally-spaced collars (**11, 12**) which define therebetween a peripheral groove (**13**), wherein the retainer includes a respective aperture (**16, 17, 18**) for each of the plug pins, each of said apertures having a diameter which is slightly greater than the diameter of one of the collars of the associated plug pin, and wherein the holder includes a plurality of slots (**19, 20, 21**), the peripheral groove of each plug pin engaging within a respective slot of the holder, the collars of each plug pin being positioned on opposite sides of the holder thereby limiting relative longitudinal movement of that plug pin relative to the holder, and said one collar of each plug pin being positioned within the associated aperture of the retainer.

4,544,186

UNITARY CLAMP ACTION FITTING

Oscar Proni, Hollywood, Fla., assignor to Proni Industries, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 339,695, Jan. 15, 1982,. This application Dec. 21, 1982, Ser. No. 451,928
Claims priority, application Canada, Dec. 10, 1985, PCT/US82/01723
Int. Cl.⁴ F16L *21/06*
U.S. Cl. 285—243 **13 Claims**



1. A cantilever clamp action fitting for holding a tubular or cylindrical member having a longitudinal axis at least partially therethrough, comprising a circumferentially continuous main body and a nut having a parallel-sided, internally threaded bore, said main body comprising:

an axial passageway extending into said body along the longitudinal axis,

an externally threaded segmented substantially straight end which can mate with the nut and which has slots dividing the end into a plurality of segments, and

a transverse surface providing areas disposed about the longitudinal axis, said transverse surface being substantially perpendicular to the longitudinal axis and forming a camming a reacting force surface for the nut;

said threads on said nut and said segments each having tapered side walls,

the axial passageway, segmented end and transverse surface being arranged such that when a member is inserted into the passageway and the nut is tightened against the transverse surface, a reactive compressive force is transmitted through the nut, via the internal nut threads reacting on the externally segment threads, to the segments of the segmented end, and both radial and longitudinal components of the reactive force contribute to the bending of the segments and cause each segment to bend inward toward the longitudinal axis, thereby clamping the member tightly.

4,544,187

HOSE END FITTING

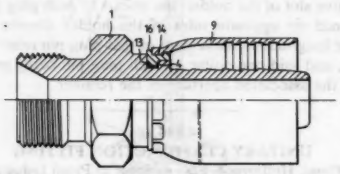
Richard D. Smith, Yorkshire, England, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 386,759, Jun. 9, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 633,678

Claims priority, application United Kingdom, Jun. 10, 1981, 8117761

Int. Cl.[4] F16L *33/20*

U.S. Cl. 285—256 **3 Claims**



1. An assembly for providing a preassembled, unitary hose end fitting which after being crimped to transform said assembly into said fitting can be easily field-installed by coaxially inserting a hose end into an axially-opening annular socket defined radially between a radially inner tubular fitting insert tail portion and a radially outer tubular ferrule body free end portion, and swaging the ferrule body free end portion radially inwards toward the fitting insert tail portion,

said assembly comprising:

a hose end fitting body having an axially extending tubular tail portion based thereon, there being a plurality of radially outwardly projecting, axially spaced teeth formed externally on said tubular tail portion, and there being formed on said hose end fitting body axially adjacent said tubular tail portion:

a circumferential external rib providing an annular shoulder having a greater outer diameter than said tubular tail portion has axially adjacent said annular shoulder, and

axially separated from said tubular tail portion by said annular shoulder, a circumferentially extending, radially outwardly opening annular recess;

an annular ferrule collar of swageable material including:

a circumferentially extending radially inwardly projecting internal annular rib initially having an internal diameter which is at least slightly greater than the outer diameter of said annular shoulder and a length axially of said annular ferrule that is sufficiently short as to receive said annular shoulder upon radially inward swaging of said annular ferrule collar, and,

axially adjacent said internal annular rib, a socket end wall-providing portion initially having an internal diameter which is less than that of said internal annular rib and which is arranged to radially abut said annular shoulder upon radially inward swaging of said annular ferrule collar,

located axially toward a same end of said annular ferrule collar as said internal annular rib, an external abutment initially having an outer diameter which is greater than the internal diameter, at a corresponding end, of a ferrule body which is to be swaged thereto,

located axially toward an opposite end of said annular ferrule collar from said same end, a circumferentially extending, radially outwardly projecting shoulder initially having an outer diameter which is not greater than the internal diameter at said corresponding end, of said ferule body, and

axially between said external abutment and said shoulder of said annular ferrule collar, a circumferentially extending, radially outwardly opening external annular recess;

a tubular ferrule body of swageable material, said ferrule having:

a base portion adjoining said corresponding end thereof, and

a free end portion extending axially from said base portion to an opposite end thereof,

there being a plurality of axially spaced radially inwardly opening circumferentially extending recesses provided internally on said free end portion of said tubular ferrule body;

said tubular ferrule body being constructed and arranged to be slid at said corresponding end thereof coaxially telescopically onto said annular ferrule collar until said corresponding end axially abuts said abutment;

said annular ferrule collar being constructed and arranged to be slid telescopically onto said hose end fitting body, over said tail portion first, until said internal annular rib of said annular ferrule collar radially surrounds said annular recess in said hose end fitting body, so that upon applying sufficient radially inward crimping force on said tubular ferrule body and annular ferrule collar, adjacent said corresponding end of said tubular ferrule body, one may thereby simultaneously unite said hose end fitting body and said tubular ferrule body via said annular ferrule collar, and create said axially-opening annular socket, by:

deforming said internal annular rib of said annular ferrule collar into said annular recess on said hose end fitting body,

deforming said socket endwall-providing portion into radial abutment with said annular shoulder on said hose end fitting body; and

deforming said tubular ferrule body adjacent said corresponding end thereof into said external annular recess in said annular ferrule collar.

4,544,188

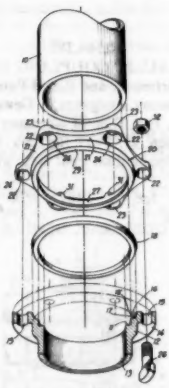
PIPE JOINT GLANDS

Ben A. Dugger, Phenix City, Ala., assignor to Columbus Foundries, Inc., Columbus, Ga.

Filed Apr. 6, 1983, Ser. No. 482,624

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—337 **17 Claims**



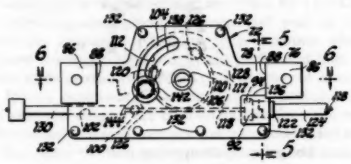
1. A pipe joint gland for forming an effective fluid seal between interfitting bell and spigot pipe sections, comprising:

(a) a web of substantially constant thickness adapted to surround a spigot pipe section in a plane normal to the spigot pipe section axis;

(b) a generally axial wall connected to the interior margin of the web, adapted to surround the spigot pipe section and extending from one side of the web;

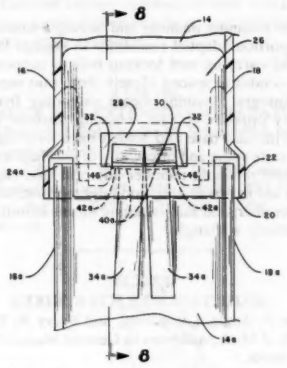
(c) an elastic seal annular contact face formed on the end of the wall away from the web, wherein the face;
(i) tapers, from its outer periphery, at a shallow angle to a plane normal to the axis of the spigot pipe section, toward the web;
(ii) is radially wider than the wall; and
(iii) projects inwardly from the interior surface of the wall;
(d) a plurality of bosses formed circumferentially and spaced equidistantly from each other on the side of the web away from the wall, radially outward of the wall; and
(e) a plurality of bolt holes penetrating the bosses and the web, wherein each corresponds to a boss and:
(i) is circular in shape on the end of the boss away from the wall;
(ii) is oval in shape on the side of the web toward the wall; and
(iii) tapers uniformly from circular to oval shape.

4,544,189
LATCH RELEASE ARRANGEMENT
Stephen J. Fiordellisi, Warren; Bela Gergoe, Birmingham, and John W. Hamilton, Dearborn, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 11, 1984, Ser. No. 570,005
Int. Cl.[4] E05C *13/06*
U.S. Cl. 292—50 **3 Claims**



1. In a vehicle body including first and second closure latch means and first and second release means for respectively releasing the first and second latch means upon actuation thereof, a latch release actuator arrangement comprising, in combination,
a rotatable cam member mounted on the vehicle body,
means on the cam member operative to actuate the first release means to effect release of the first latch means upon rotation of the cam member in one direction,
first and second spaced housings mounted on the vehicle body,
a flexible elongate conduit connecting the first and second housings,
first and second rotatable members respectively rotatably mounted in said first and second housings,
means operative to actuate the second release means to effect release of the second latch means upon rotation of the second rotatable member,
a flexible elongate member extending between the first and second housings through the conduit,
means connecting the flexible member to the first and second rotatable members to effect concurrent rotational movement thereof upon movement of the flexible member within the conduit,
means on the first rotatable member engageable by the cam member upon rotation of the cam member in a direction opposite the one direction to rotate the first rotatable member and move the flexible member within the conduit to effect concurrent rotation of the second rotatable member,
resilient means operative between the second rotatable member and the housing thereof to resist rotation of the second rotatable member and bias the first rotatable member in the one direction through the first elongate member,
means operative between the first rotatable member and the first housing to locate the first rotatable member in a predetermined first position relative to the cam member against the bias of the resilient means and thereby locate the second rotatable member in a predetermined first position,
and power actuating means selectively connectable to the first rotatable member for rotating the first rotatable member independently of rotative movement of the cam member, the first rotatable member effecting concurrent rotation of the second rotatable member through the flexible member.

4,544,190
CONNECTION NUT SEAL
Allan W. Swift, Denville, and Sarah B. S. Rivara, Blairstown, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.
Filed Aug. 15, 1983, Ser. No. 523,098
Int. Cl.[4] B65D *27/30, 33/34, 55/06*
U.S. Cl. 292—307 B **9 Claims**

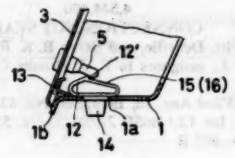


1. A seal housing portion for assembly with an identical housing portion to enclose a device to be protected, said housing portion comprising a body shaped to enclose said device when assembled with an identical housing portion, said housing portion having fasteners positioned at spaced locations thereon shaped and positioned for locking engagement with the fastener portions of an identical housing portion, one of said fastener portions comprising a member having an aperture, the other fastener portion comprising at least two resilient legs having locking shoulders positioned and dimensioned for locking engagement in the aperture of an identical housing portion for locking engagement with the edges of said aperture, said aperture having a side edge and an end edge at each end of the side edge and said legs are dimensioned and positioned so that at least one of said legs has locking shoulders latched into simultaneous engagement with both the side edge and an end edge.

4,544,191
LOCKING LATCH FOR LID
Daiji Nakama, Chigasaki, Japan, assignor to Nifco, Inc., Yokohama, Japan
Continuation of Ser. No. 613,757, May 24, 1984, abandoned, which is a continuation of Ser. No. 335,043, Dec. 28, 1981, abandoned. This application Oct. 11, 1984, Ser. No. 659,511
Claims priority, application Japan, Jan. 12, 1981, 56-1644[U]
Int. Cl.[4] B65D *55/14*
U.S. Cl. 292—341.15 **3 Claims**

1. A one-piece latch molded of resilient plastic material comprising a substantially flat imperforate base adapted to be

mounted against a supporting surface, fastener leg means integral with and extending from the underside of said base and adapted to snap resiliently in place in an aperture in said supporting surface to mount said base flat against said surface, a resilient retaining member integral with and extending in coplanar relation with said base from an edge of said base in a first direction and folded back over itself and said base at an acute angle and extending substantially oppositely of said leg means and outwardly away from said base, said retaining member having engaging edge portion at an extremity of said latch adapted to engage a hook portion of a locking bolt, an integral resilient compression piece extending in said first direction



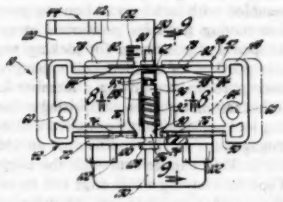
beyond said retaining member and having a folded over reentrant end portion adapted resiliently to engage the inner surface of a lid carrying said locking bolt to support said lid in anti-rattle condition spaced closely from said supporting surface, and integral retaining means extending from said base substantially opposite to said retaining member substantially coplanar with said base and folded back over itself and said base at an acute angle and outwardly of said base and integrally joined to said retaining member adjacent said engaging edge portion for aid in positioning said edge portion, said base, said retaining member, and said retaining means in outline comprising substantially a triangle.

4,544,192

ADJUSTABLE LATCH STRIKER

Christopher P. Angle, Laingsburg, and Barry R. Parker, Lansing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 27, 1982, Ser. No. 424,466
Int. Cl.⁴ E05B *15/02*
U.S. Cl. 292—341.18 **3 Claims**



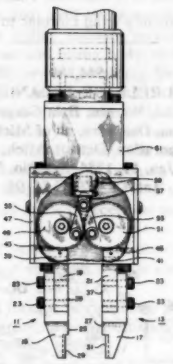
1. A striker assembly for mounting on a door jamb and adapted for latching engagement by a latch mounted on a door movable about a hinge axis, said striker assembly comprising,
- a first member adapted for mounting on the door jamb in a fixed position,
- a second member having a striker element carried thereon for latching engagement by the latch upon closure of the door,
- track means mounting the second member on the first member for adjusting movement in a direction parallel to the hinge axis,
- ratchet means acting cooperatively between said first and second members to releasably maintain them in adjusted relative position,
- and cam means responsive to latching engagement of the latch with the striker element to release said ratchet means and adjustably move, under the force of said latching engagement only, the second member along the track means and thereby automatically align the striker element with the latch.

4,544,193

ROBOT GRIPPERS

Jimmy L. Dunn, 405 Apple Blossom La., Hurst, Tex. 76053; Lonnie D. Gilstrap, 1915 Mimosa, Arlington, Tex. 76012; Ronny L. Land, 124 Kenshire Dr., Benbrook, Tex. 76126, and Frank C. Romeo, 7513 Lochwood Ct., Fort Worth, Tex. 76179

Filed Apr. 6, 1983, Ser. No. 482,600
Int. Cl.⁴ B25J *15/02*
U.S. Cl. 294—86.4 **5 Claims**



1. A robot gripper, comprising:
- a hand;
- a pair of fingers slidably mounted to the hand for movement in opposite directions along parallel axes, wherein the fingers have opposed faces to selectively grip or release objects;
- a pair of racks, wherein each rack is attached to the upper end of one of the fingers, and wherein each rack is perpendicular to the opposed faces and faces upwardly;
- a pair of pinions, rotatably mounted in the hand, wherein each pinion drivably engages one of the racks;
- a rod mounted in the hand;
- linear drive means for moving the rod linearly; and
- translation means, engaging the pinions and the rod, for rotating the pinions in opposite directions in response to linear movement of the rod, to cause the fingers to move in opposite directions.

4,544,194

PLURAL BOTTLE CARRIER

Frederick C. Allen, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

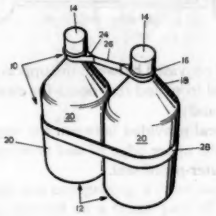
Continuation of Ser. No. 383,058, May 28, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,107
Int. Cl.⁴ B65D *71/04*
U.S. Cl. 294—87.2 **4 Claims**

1. A plural container carrier for securing together a pair of identical containers, each said container having an open neck finish portion, an outstanding bead portion disposed below said finish portion, an angled shoulder portion disposed below said bead portion and an elongate, hollow, enlarged diameter closed bottom, main body portion, said main body portion being in communication with said open neck finish portion, said carrier comprising:

a body of elastic, thermoplastic material initially formed in a

single sheet and including a first, elongated inner portion suited to engage each of the containers and upon engagement be disposed under said outstanding bead portion of said containers and a second, elongated, outer band portion surrounding said first portion and initially connected thereto along a pair of perforated score lines,

said first portion of said carrier having a pair of container receiving apertures adapted to register and be stretched about the neck finish portion of said pair of containers, with said container bead portions of said containers protruding through said container receiving apertures wherein said first portion of said carrier has a central, generally rectangular web portion connecting the container receiving apertures which are defined by a pair of



closed, curvilinear container engaging loop portions, and said web portion is divided into two sides by a perforated line extending therealong between said pair of closed curvilinear container engaging loop portions whereby said web is easily folded along said perforated line;

such that as the carrier is lowered onto the pair of containers and forced downwardly to engage the containers, the loop portions engage the containers, are forced over the bead portions and said web portion becomes folded so that the first inner portion engages the containers under the bead portion and the second outer band portion is severed from the first inner portion along the perforated lines therebetween and the second outer band portion is stretched about the main body portion of the containers.

4,544,195

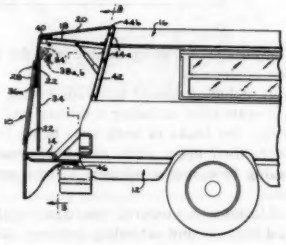
REAR COVER FOR PICKUP TRUCK WITH ATTACHED RIGID CAMPER ENCLOSURE

Mary M. Gunn, 4321 Lonsdale, Louisville, Ky. 40215

Filed Nov. 21, 1983, Ser. No. 553,843

Int. Cl.[4] B60D *3/34*

U.S. Cl. 296—26 **14 Claims**



1. A cover for use on a conventional pickup truck of the type having a tailgate tiltable from an upright closed position downwardly to a horizontal open position and a rigid camper enclosure mounted over a bed of said truck having an upper rear panel tiltable from a vertially hanging closed position upwardly to a raised open position, said cover comprising

a flexible sheet extending over rear and side edges of said panel and tailgate when in their open positions and having a forward edge portion removably connectable along side and upper rear edge portions of said camper enclosure, said sheet defining at least one window opening therein and a slit extending from a lower rear end of said sheet upwardly a distance at least sufficient to provide access to said camper enclosure,

a screen disposed in registry with said window opening and having a border attached to a surface of said sheet around said opening,

a flexible window pane disposed in registry with said opening, said pane being attached to a surface of said sheet around said opening and being at least partially detachable,

a curtain attached to an interior surface of said sheet having an operative position for covering said window opening and a stored position out of registry with said opening, and

means for connecting lower forward side portions of said sheet across the rear end of said truck for drawing the lower sides of said sheet against the sides of said tailgate, said connecting means comprising a cord having hook terminating ends tautly connected between opposite lower forward corner portions of said sheet, said cord extending across the underside of said tailgate from one side to the other thereof.

4,544,196

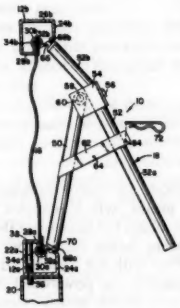
TRUCK BOX EXTENSION APPARATUS

Steven C. Schmeichel, and Charles M. Schmeichel, both of Highway 20, Jamestown, N. Dak. 58401

Continuation of Ser. No. 399,454, Jul. 19, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,479

Int. Cl.[4] B62D *33/08*; B60P *7/04*

U.S. Cl. 296—26 **12 Claims**



1. An adjustable extension apparatus for mounting on the sidewalls of a vehicle's cargo bed area such as a truck box or the like, the extension apparatus comprising:

(a) a frame assembly including an upper frame member and a lower frame member, said lower frame member being fixably attached to the top of the cargo bed sidewall, said frame assembly having lowered and raised positions, said upper frame member resting on said lower frame member in said lowered position, said upper and lower frame members having opposing surfaces each including a horizontal surface portion and a surface portion oblique with respect to the horizontal surface portion, said oblique surface portions defining a gap therebetween facing the cargo bed area when in said lowered position, said upper frame member being vertically spaced from said lower frame member in said raised position, said upper and lower frame members each further defining a channel extending longitudinally thereof;

(b) horizontally spaced apart jack apparatus interconnecting said upper and lower frame members, said jack apparatus cooperating with said upper and lower frame members to

raise and retain said upper frame member in said raised position; and

(c) a flexible material having upper and lower edges being slidably attached to said lower and upper frame members at said upper and lower edges, said flexible material having a first side facing toward the vehicle's cargo bed area and a second side facing away from the vehicle's cargo bed area, said flexible material including a hem structure positioned adjacent to each of said upper and lower edges, said hem structure of said upper and lower edges being slidably mounted in said channels of said lower and upper frame members, said jack apparatus being positioned on the first side of said flexible material facing the vehicle's cargo bed area, said flexible material cooperating with said oblique surface portions of said lower and upper frame members to hang on the inside of the cargo bed area when in said lowered position.

4,544,197

WINDSHIELD FOR MOTOR VEHICLES EQUIPPED WITH A WINDSHIELD WIPER INSTALLATION

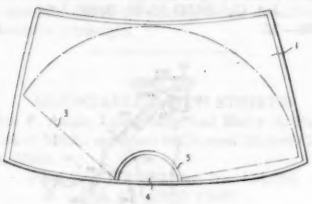
Manfred Schmidt, Sindelfingen; Hans Trube, Herrenberg, and Martin Pfeiffer, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 601,005

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313659

Int. Cl.⁴ B60J *1/02*

U.S. Cl. 296—84 R **11 Claims**



1. A windshield for motor vehicles equipped with a windshield wiper means, which includes in its lower area strip-shaped profile means for improving the wiped field, the side of the profile means facing the bottom edge of the windshield forming together with the windshield surface a water-collecting groove open in the downward direction, and the upper edge area of said profile means extending substantially along the lower edge area of the coordinated wiped field.

4,544,198

AUTOMOTIVE VEHICLE WITH FRONT AND REAR SLIDING DOORS

Akira Ochiai, Sagamihara, and Yoshitaka Suzuki, Odawara, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 14, 1983, Ser. No. 513,688

Claims priority, application Japan, Jul. 16, 1982, 57-124191

Int. Cl.⁴ B60J *5/04*

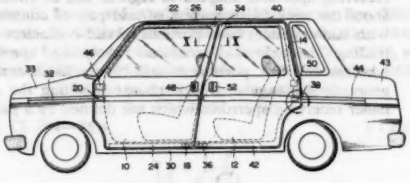
U.S. Cl. 296—155 **4 Claims**

1. An automotive vehicle comprising:

a front sliding door slidingly supported by a vehicle side member for closing approximately a front half of a door opening;

a rear sliding door slidingly supported by said vehicle side member for closing approximately a rear half of the door opening, said rear sliding door having a front edge directly opposing a rear edge of said front sliding door when said doors are both in their closed positions;

upper and lower slider assemblies pivotably attached to each of said doors and engageable to respective upper and lower guide rails mounted on upper and lower side frames of the vehicle side frame, said side frame having openings near the end portions of said guide rails, the front ends of said guide rails curving so as to pass through the openings in said side frame;



a vertical seal provided between the opposing rear and front edges of said front and rear doors for establishing a water-proof seal; and

a horizontal seal provided between the upper edges of said doors and the upper edge of said door opening for establishing a water-proof seal.

4,544,199

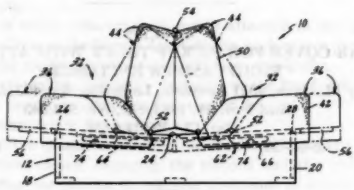
ADJUSTABLE BOAT SEAT

Robert A. Wrigley, Grosse Pointe Farms, Mich., assignor to Detroit Marine Engineering, Inc., Detroit, Mich.

Filed Feb. 24, 1984, Ser. No. 582,130

Int. Cl.⁴ A47C *15/00*

U.S. Cl. 297—244 **10 Claims**



1. An adjustable reclining double seat for boats and like application comprising

a support including spaced sidewalls having upper edges,

a pair of seats each including a bottom and a back hinged together, the backs of both seats being hinged together adjacent their upper ends, said backs and said bottoms including base means adapted to rest upon said upper edges,

a pair of locking bars secured one to each of the base means of said bottoms and extending between said spaced sidewalls, and

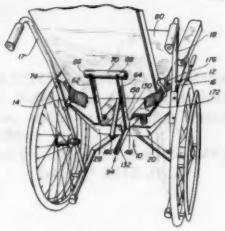
a pair of molded plastic tracks mounted in opposed relation on the inner faces of said sidewalls, each of said tracks including a closed channel which extends lengthwise of the seat and slidably retains the opposite ends of said locking bars, each channel having at least one vertically extending recess for receiving one end of said bar when said seat bottom base means are resting on said upper edges.

4,544,200

WHEELCHAIR WITH ROCKING SEAT AND RECLINING BACK FEATURE

Philip Dunn, 9221 N. Odell, Morton Grove, Ill. 60053, and David A. King, Oconomowoc, Wis., assignors to Philip Dunn, Morton Grove, Ill.

Filed Jun. 2, 1983, Ser. No. 500,416
Int. Cl.[4] A47C *3/02*
U.S. Cl. 297—265 **44 Claims**



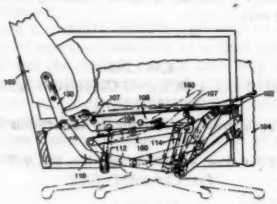
1. A wheelchair seat comprising, a chair support adapted to be removably positioned on a frame part of a wheelchair, a chair base mounted on said chair support and having a seat platform secured thereto, spring means positioned between said base and support for imparting rocking movement to said chair base relative to said chair support, and locking means between said chair base and chair support operable to selectively render said chair base immovable relative to said chair support.

4,544,201

ROCKING AND RECLINER CHAIRS

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Continuation-in-part of Ser. No. 480,255, Mar. 30, 1983,. This application Sep. 15, 1983, Ser. No. 534,625
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—271 **11 Claims**



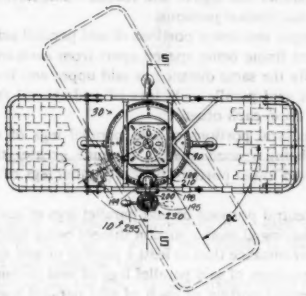
10. A rocking and reclining chair having a base, a seat mounted on the base, a backrest connected to the seat and a footrest mounted to the seat for movement between extended and retracted positions, a linkage system including a seat link fixed to the seat, a carrier link below the seat link, linkage means mounting the seat link to the carrier link, means including a pair of swing arms pivotally suspending the carrier link from the base for swinging the seat relative to the base along an arc during which the seat is also displaced in a generally horizontal direction relative to the base, a footrest linkage mounted relative to the seat link for supporting the footrest between extended and retracted positions, and actuating means for driving the footrest linkage.

4,544,202

SEMIAUTOMATICALLY ACTUATED ROTABLE LOUNGE CHAIR

Tanya L. Keaton, 29168 Kearsley, Millbury, Ohio 43447

Filed Jan. 29, 1982, Ser. No. 344,022
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—349 **1 Claim**



1. A portable outdoor chair, having a seat portion, which seat portion is capable of being semi-automatically rotated in a horizontal plane about a base member, said device comprising:

(a) a base member with vertically depending legs for fixedly positioning said base member on the ground, said base member having a horizontally disposed plate member disposed on the upper surface of said base member, said plate member comprising on its peripheral surface a ring gear member with female openings on the circumference thereof to receive male gear teeth;

(b) an upper pivotable member pivotally mounted to the lower base member, said upper pivotable member having seat means integrally affixed to the upper portion of said upper pivotable member;

(c) combined ratchet and movement means integrally disposed on said upper pivotable member about said base member in a pivotable manner, said combined movement and ratchet means comprising a longitudinal shaft member, said shaft member being housed in a cylindrical housing and wherein said shaft has an upper end and a lower end, wherein said upper end has a circular head concentrically mounted on said end, and on the upper surface of said circular head is mounted a plurality of bosses and a pivotable handle, one end of which is engageable with one or more such bosses when said handle is pivoted downwardly, whereas said handle when engaged against one or more such bosses will cause said shaft to rotate, and wherein mounted concentrically on the lower end of said shaft is a circular follower gear adapted to movingly engage the ring gear on said base member such that rotation of the shaft by said handle will cause said shaft to rotate said follower gear about said ring gear causing the upper pivotable member to pivot about said base member.

4,544,203

FOLDABLE HEAD REST

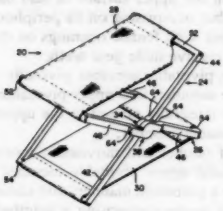
Steven K. Younger, 32804 42nd Ave. SW., Federal Way, Wash. 98502, and Rudolf A. Fiedelak, 1722 Austin Rd., NE., Tacoma, Wash. 98422

Filed Oct. 11, 1984, Ser. No. 659,693
Int. Cl.[4] A47C *7/36, 4/38*
U.S. Cl. 297—391 **3 Claims**

1. A foldable headrest having a first opened and second folded position comprising:

(a) a first molded integral one piece rectangular frame having upper and lower parallel ends and connecting parallel side legs,

(b) a second molded integral one piece rectangular frame having upper and lower parallel ends and connecting parallel side legs,
(c) said first and said second frames having substantially equal length,
(d) said parallel side legs of said first frame having upper, lower and central portions,
(e) said parallel side legs of said second frame having upper, lower and central portions,
(f) said upper and lower portions of said parallel side legs of said first frame being spaced apart from each other substantially the same distance as said upper and lower portions of said parallel side legs of said second frame are spaced from each other,
(g) said central portions of said parallel legs of said first frame being spaced apart a distance greater than said upper and lower portions of said parallel legs of said first frame,
(h) said central portions of said parallel legs of said second frame having at least a portion thereof being spaced apart a shorter distance than at least a portion of said upper and lower portions of said parallel legs of said second frame,
(i) said central portion of each of said parallel legs of said first frame having an inwardly projecting key integrally molded therewith,
(j) said central portion of each of said parallel legs of said second frame having a cooperating opening therethrough for receiving a respective cooperating key of said first frame,



(k) each of said frames being resiliently flexible a distance sufficient for said respective inwardly projecting keys of said first frame to be engaged with and disengaged from said respective openings of said second frame by bowing of said first and second frames outwardly with respect to each other,
(l) said upper portions of said parallel legs of said first and second frames being offset laterally from said lower portions of said parallel legs of said first and second frames,
(m) each of said central portions of said legs of said first and second frames having short laterally spaced extensions and a central hub portion,
(n) said laterally spaced extensions being tangentially arranged on their respective hub portions,
(o) stop connecting means on each of said laterally spaced extensions of said central portion connected to their respective upper and lower leg portions for limiting the travel of said frames when in opened and closed positions,
(p) a first fabric panel having ends, one end being connected to said first frame upper end and the other end connected to said second frame upper end,
(q) a second fabric panel having ends, one end being connected to said first frame lower end and the other end connected to said second frame lower end, and
(r) said panels being of a length so that when said frames are in said opened position, said panels will be substantially taut.

4,544,204

BACK FRAME FOR SEAT, PARTICULARLY FOR POWER VEHICLE SEAT

Gerhard Schmale, Hückeswagen, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 440,022
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3144711
Int. Cl.⁴ B60N 1/00
U.S. Cl. 297—452 **22 Claims**

1. A back frame for a seat, particularly a power vehicle seat, comprising

a transverse member; and

two side members each having one end connected with said transverse member in a connecting point and another end provided with a connecting ear for connecting with a hinge of a seat pad frame, each of said side members having a U-shaped cross section with a web, and front and rear legs connected with said web and located at opposite sides of a center plane extending between said legs, said web of each of said side members narrowing from said connecting ear to said connecting point of the respective side member, said rear leg of each of said side members also narrowing from said connecting ear to said connecting point of the respective side member and being longer than said front leg so that the cross section of each of said side members is asymmetrical relative to the center plane of said cross section and the asymmetry reduces from the other end to said one end, at least one leg of at least one side member having a part which extends transverse to said center axis of said cross section of said at least one side member so that in the event of an accident and resulting high loading of said transverse member said side members are turnably deflected without breaking in the region of said one end.

4,544,205

SEAT AND SELF-LOCKING CUSHION ASSEMBLY THEREFOR

John Molnar, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 16, 1983, Ser. No. 504,915
Int. Cl.⁴ A47C 7/18
U.S. Cl. 297—455 **15 Claims**

1. A self-locking cushion assembly for connection to a seat

shell having a plurality of upwardly inclined fingers and a plurality of openings, comprising:

a cushion defining a plurality of inner face recesses; and

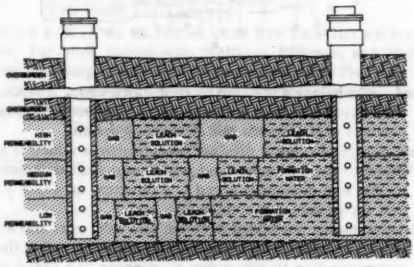
a supporting frame connected to the cushion and having a plurality of locking projections depending at a right angle therefrom each of the recesses being adapted in use to individually receive one of the inclined fingers with the frame being overlappingly retained by the inclined fingers, and each of the locking projections being adapted in use to individually extend downwardly within one of the openings for releasably securing the cushion assembly to the seat shell.

4,544,206

SLUG-TYPE IN SITU RECOVERY OF MINERAL VALUES

Donald R. Wier, Bartlesville, Okla., and Gordon D. Gillham, Littleton, Colo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1982, Ser. No. 449,362
Int. Cl.⁴ E21B *43/28*
U.S. Cl. 299—4 **4 Claims**



1. A method for the in situ recovery of mineral values from a heterogeneous subsurface earth formation containing mineral values, which formation comprises zones of both high and low permeability, comprising:

(a) injecting a plurality of separate slugs of a leach solution, adapted to solvate said mineral values, into at least one injection well in communication with all zones of said formation;

(b) injecting a slug of gas, which is essentially insoluble in said leach solution, between each two successive slugs of leach solution;

(c) injecting a mobility modifier, adapted to decrease the mobility of said leach solution, at at least one of the trailing end and the leading end of each slug of said leach solution which is in contact with a slug of said gas; and

(d) withdrawing pregnant leach solution, containing significant amounts of solvated mineral values, from at least one production well in communication with all zones of said formation.

4,544,207

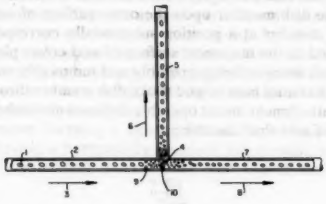
PROCESS FOR THE UNIFORM DISTRIBUTION OF A TWO PHASE MIXTURE

Lawrence M. Litz, Pleasantville, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 14, 1982, Ser. No. 397,974
Int. Cl.⁴ E21B *43/28*
U.S. Cl. 299—5 **5 Claims**

5. In a process for the in-situ mining of a metal from an underground ore body containing an insoluble metal compound by introducing a two phase mixture of an oxygen containing gas and a barren lixiviant via a distribution network of conduits down into individual injection wells connected to the ore body, said network comprising a series of conduits, each of which divides at one point into at least two conduits; oxidizing the insoluble metal compound to provide a metal compound soluble in the lixiviant; dissolving the soluble metal compound in the lixiviant to provide a pregnant lixiviant; removing the pregnant lixiviant via production wells through the network to a point where the metal is separated from the lixiviant; and reintroducing the barren lixiviant into the network,

the improvement comprising



(a) creating a turbulent environment in each conduit just prior to the point at which the conduit is divided into at least two conduits; and

(b) transporting the gas/lixiviant mixture down the injection well via a downcomer pipe at a liquid flow velocity of at least about one foot per second.

4,544,208

DEGASIFICATION OF COAL

Thomas R. Miller, Waynesburg, Pa., assignor to Concoco Inc., Wilmington, Del.

Filed Jul. 23, 1984, Ser. No. 633,728
Int. Cl.⁴ E21F *5/00*
U.S. Cl. 299—12 **3 Claims**

1. A method for degasifying a coal seam comprising:

(a) establishing an underground working face within said seam;

(b) drilling a borehole horizontally away from said face and within said seam utilizing drilling rod means provided with an axial passage;

(c) terminating said drilling step;

(d) removing said drilling rod means from said borehole;

(e) positioning propping agent within a portion of said axial passage of said drilling rod means;

(f) inserting a piston means into said axial passage behind said propping agent;

(g) advancing said drilling rod means containing propping agent and piston means into said borehole; and

(h) displacing said propping agent from said drilling rod means by applying fluid pressure into said axial passage against said piston means while concurrently withdrawing said drilling rod means from said borehole.

4,544,209

MOTOR VEHICLE WHEEL CENTER INCLUDING AN ANTI-THEFT FEATURE

Martin Braungart, Alpirsbach, Fed. Rep. of Germany, assignor to BBS Kraftfahrzeugtechnik, GmbH+Co. KG., Postfach, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,011
Int. Cl.⁴ B60B *7/02, 1/00*
U.S. Cl. 301—37 AT **17 Claims**

1. An improved motor vehicle wheel center apparatus for attachment to the lug bolts of a vehicle axle and including an anti-theft feature associated therewith, said apparatus comprising:

a spoke disk member;

said spoke disk member having a central bore aligned co-axially with respect to the axis of rotation of said wheel;

a plurality of co-axially positioned passage holes formed about the periphery of said central bore and provided to allow for the aligned passage therethrough of said lug

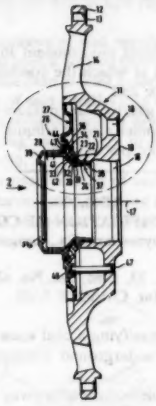
bolts for the fastening of same thereabout by aligned corresponding lug nuts to in turn restrainably affix said spoke disk member to the axle wheel hub of said vehicle;

a hub cap member;

said hub cap member consisting of a cover plate having a central aperture and a shaft member passing therethrough;

said cover plate being operably co-axially maintained in a position interposed between said shaft member and said spoke disk member upon the outer surface of said spoke disk member at a position substantially correspondingly shaped to the innermost surface of said cover plate;

said shaft member being operably and removably attachable to the central bore of said spoke disk member through hub cap attachment means operably disposed about the periphery of said shaft member;



said hub cap member being so removably attachable to the outer surface of said spoke disk member to enable said cover plate to cover said lug nuts and bolts;

theft prevention means operably associated with said hub cap member so as to impede undesired removal of said hub cap member from its position about said spoke disk member and in turn impede unauthorized access to said lug nuts;

alignment means operably associated with said cover plate and said spoke disk member so as to maintain consistent restrained orientation and prevent relative rotation therebetween, and;

a plurality of sealing means operably positioned between said hub cap member and said spoke disk member to prevent migration of fluid substances therebetween.

4,544,210

HYDRAULIC BRAKE INERTIA-CONTROLLED PROPORTIONING VALVE

Takashi Nagashima, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 10, 1983, Ser. No. 474,126

Claims priority, application Japan, Mar. 20, 1982, 57-45149; Mar. 20, 1982, 57-45150; Sep. 29, 1982, 57-171777

Int. Cl.[4] B60T *8/14*

U.S. Cl. 303—6 C **8 Claims**

1. A hydraulic brake control assembly for a vehicle having a master cylinder and a brake wheel cylinder comprising:

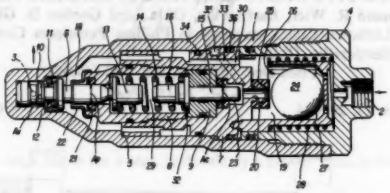
a housing having an inlet port which is in communication with said master cylinder and an outlet port which is in communication with said brake wheel cylinder and which includes a stationary member fixed to said housing;

proportioning valve means having a pressure receiving area positioned within said housing and which further comprises a piston for effecting proportioning operation;

a single plunger mounted in sliding contact with said stationary member and coaxial with said piston wherein said plunger is positioned within said housing;

first spring means positioned between said piston and said plunger for biasing said piston in a direction wherein said proportioning valve means is positioned in an open position;

said housing including a first chamber formed therein in communication with said inlet port and in communication with said outlet port by means of said proportioning valve means and a second chamber in communication with said inlet port;



said piston having a pressure receiving area which is exposed to the hydraulic fluid within said first chamber so that said piston is urged against said first spring means;

said plunger having a pressure receiving area which is exposed to the hydraulic fluid within said second chamber so that said plunger is urged in a direction in which said first spring means is compressed; and

G-valve means positioned between said inlet port and said second chamber within said housing for interrupting fluid communication therebetween in response to a preset deceleration of said vehicle wherein the pressure receiving area of said Plunger is smaller than the pressure receiving area of said piston and said pressure receiving area of said proportioning valve is greater than said pressure receiving area of said piston.

4,544,211

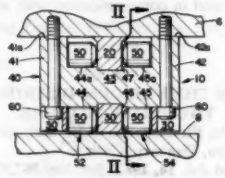
RECIRCULATING BEARING ASSEMBLY AND METHOD OF MAKING

Ki C. Kwon, Charlotte, and Thomas A. Luther, Matthews, both of N.C., assignors to The Warner & Swasey Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 444,292, Nov. 24, 1982, Pat. No. 4,496,195. This application Nov. 30, 1983, Ser. No. 556,530

Int. Cl.[4] F16C *29/06*

U.S. Cl. 308—6 C **5 Claims**



1. A recirculating element bearing adapted to be disposed between relatively linearly movable support members to provide antifriction support therebetween, said bearing comprising:

an elongated unitary track member formed with a pair of parallel, side-by-side and spaced apart track surfaces each defined by upper and lower surfaces extending along the length of said track member and by half-round surfaces at

either end thereof extending between the upper and lower surfaces, thereby providing an endless recirculation path;

housing means extending around each of said track surfaces to enclose said track surfaces with a space between each track surface and said housing means;

a plurality of elongated rollers disposed within each of said spaces and oriented to roll along said track surfaces, said housing means exposing said rollers above one of said track surfaces to enable contact with one of said support members;

said track member provided with at least one lengthwise extending medial feature discontinuous with said track surfaces;

said at least one medial feature comprising a lengthwise extending recess formed into said upper surface of said track member; and,

said housing means including a pair of housing members mounted to said track member and to each other, one of said housing members including a lengthwise extending linearly formed portion interfit into said recess to be located thereby.

4,544,212

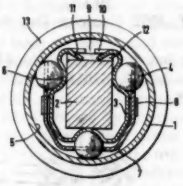
LINEAR ROLLING BEARING FOR RECTANGULAR BAR

Walter Parzefall, Bubenreuth; Wolfgang Pflügner, and Wolfgang Steinberger, both of Herzogenaurach, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,165

Int. Cl.[4] F16C *29/04, 1/28*

U.S. Cl. 308—6 R **13 Claims**



1. A rolling bearing for longitudinal movements of limited slide path for guiding a rectangular cross-section bar comprising an outer element, an inner element and rows of balls rolling between said elements, the outer element on whose bore wall the balls roll being insertable into a cylindrical housing bore and the inner element, being provided with straight, axially extending inner ball races and at least partially surrounding the rectangular cross-section bar, bears against the bar by the back of its ball races, characterized in that the outer element is formed as a cylindrical tube section and the inner element is connected to the bar to form a structural unit so that it is retained on the bar in its position required for operation and a cage retaining the balls at the inner element is provided which cage forms a structural unit with the inner element.

4,544,213

DISKETTE FILING AND STORAGE CONTAINER

Jerry M. Long, Scotts Valley, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.

PCT No. PCT/US80/01581, § 371 Date Jul. 22, 1982, § 102(e) Date Jul. 22, 1982, PCT Pub. No. WO82/01810, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 24, 1980, Ser. No. 403,774

Int. Cl.[4] A47B *63/00*

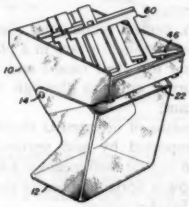
U.S. Cl. 312—183 **9 Claims**

1. A filing and storage container for floppy diskettes and the like comprising:

means forming an open-topped container base including a horizontally disposed bottom, a rearwardly leaning first rear wall of a first height, a forwardly leaning first front wall of a second height substantially lower than said first height, a pair of upstanding first side walls the upper edges of which incline rearwardly from the upper edge of said first front wall to the upper edge of said first rear wall, said base having divider means positioned at spaced intervals along the inside of at least one of said first side walls proximate to where the wall engages said bottom;

separator means disposed at least partially within said base and held in spaced apart relationship by said divider means, said separator means being rotatable between rearwardly inclined positions generally parallel to said rear wall and forwardly inclined positions generally parallel to said front wall; and

cover means forming a closure for said open-topped base and having a horizontally disposed top portion, a downwardly extending second front wall sloped rearwardly



and lying generally parallel to said first rear wall and having a lower extremity adapted to engage the upper edge of said first front wall, a pair of downwardly extending second side walls disposed outwardly of said first side walls and having rear most portions which extend downwardly to points substantially level with said upper edge of said first front wall, and pivot means for pivotally attaching the lower extremities of said rear most portions of said side walls to a lower portion of said container base so that said cover means can be rotated rearwardly more than 180 degrees from a closed position covering the open top of said base to an open position with said second front wall forming a horizontally disposed support surface, the rear most extremity of said cover means engaging said bottom and combining with said pivot means to support said base in a raised position with the opening thereof facing upwardly.

4,544,214

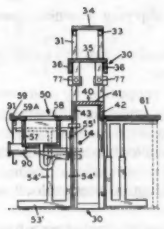
LABORATORY FURNITURE SYSTEM

Robert N. Nizel, Carlisle, Mass., and Frank D. Schimmoller, Westwood, N.J., assignors to Architectural Resources Cambridge, Inc., Cambridge, Mass.

Filed Dec. 15, 1982, Ser. No. 450,004

Int. Cl.[4] B01L *19/02*

U.S. Cl. 312—209 **8 Claims**



1. A laboratory work station comprising a plurality of free-

standing, universal laboratory utility core modules, each of which is adapted to cooperate laterally with one or more modular, adjustable laboratory bench supports, modular laboratory hood units, and modular laboratory sink units, and longitudinally with the modular laboratory units to provide a fully serviced laboratory work and equipment center, each said utility core module comprising:

(A)

(a) two pairs of spaced parallel vertical corner columns of predetermined modular height;

(b) two pairs of spaced reinforcing struts extending laterally between and connecting uppermost and lowermost portions of said pairs of columns;

(c) two pairs of spaced parallel horizontal beams connecting said two pairs of columns at the tops and bottoms thereof to form a parallelpiped service frame;

(d) rectangular, planar top shelf means supported by the upper horizontal beams and closing off the top of said service frame;

(e) full depth, central rectangular shelf means disposed beneath said top shelf means in a plane parallel to the plane of said top shelf means and supported by said vertical corner columns through first multifunction bracket means;

(f) a tunnel means of inverted-U shape cross-section adjustably supported by said vertical corner columns beneath said central shelf means at a selectable elevation above the lower horizontal beams through second multi-function bracket means;

(g) said tunnel means having a horizontal work surface parallel to said central shelf means and depending integral front and rear walls coplanar with the outside front and rear surface of the pairs of corner columns;

(h) whereby said depending integral front and rear walls are adapted to serve as a bench rear walls and whereby said core module is adapted to cooperate laterally with modular adjustable bench supports, modular laboratory hoods and modular sink units;

(B) said utility core modules are arranged and interconnected in end-to-end relation;

(C) a vent line means extends the length of said station;

(D) hanger means support said vent means immediately beneath said central shelf means;

(E) at least one independently adjustable bench having a planar work surface is abutted to one side of said module; and

(F) said bench work surface is disposed beneath the level of said work surface of said tunnel means and against one of said tunnel walls to establish a backstop means for said bench work surface.

4,544,215

SELF-CONTAINED SLIP RING ASSEMBLY

Joseph E. Fritsch, 14001 Sherwood, Oak Park, Mich. 48237

Filed Aug. 9, 1983, Ser. No. 521,587

Int. Cl.⁴ H01R *39/08, 39/38*

U.S. Cl. 339—5 M **18 Claims**

1. A self-contained slip ring assembly comprising:

a rotor;

a plurality of electrically conductive slip rings axially spaced apart on said rotor;

a housing rotatably supported by said rotor;

said housing slidably retaining a generally cylindrical brush block assembly by frictional engagement means;

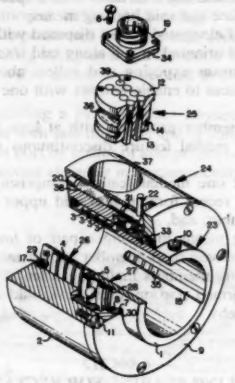
the axis of said brush block assembly is substantially perpendicular to the major axis of said rotor;

said housing including a brush block assembly aligning means;

said brush block assembly including a brush block body;

a pluarlity of passages arranged in axially spaced apart relationship through said brush block body;

a spring biased brush member slidably disposed in each said passage, extending outwardly from one end of said brush



block body to slidably engage said slip rings so as to insure an electrical connection therebetween.

4,544,216

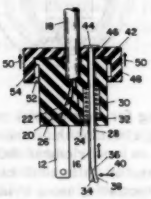
AUTOMATICALLY RELEASABLE LOCKING ELECTRIC PLUG

Robert W. Imhoff, 2062 Hanscom Dr., So. Pasadena, Calif. 91030

Filed Jun. 4, 1984, Ser. No. 616,948

Int. Cl.⁴ H01R *13/629*

U.S. Cl. 339—14 P **10 Claims**



1. A system for holding an electrical plug into a mating socket comprising:

a male plug including first and second active connector prongs; and a third grounding prong having a substantial U-shaped or V-shaped cross section, with the two sides of the cross section of the prong coming together with a ramp configuration at the outer end of said third prong;

an elongated locking member;

means for mounting said elongated locking member for longitudinal movement within the V-shaped configuration of said third prong, with the outer end of said locking member engaging said ramp when said locking member reaches its extreme outer position, to force the locking member transversely out of the recess within said V-shaped configuration of said third prong;

means for normally biasing said locking member toward the outer end of said third prong to force said locking member into locking engagement with adjacent structure of a mating socket; and

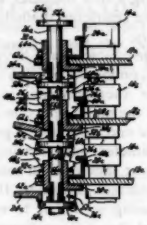
release means secured to said male plug and engaging said locking member for retracting said locking member from said ramp and unlocking the male plug from any associated mating socket.

4,544,217

EJECTOR LATCH

Alan Denny, Fountain Valley, Calif., assignor to Management Assistance, Inc., Tustin, Calif.

Filed Oct. 5, 1984, Ser. No. 658,145
Int. Cl.⁴ H05K *1/00*
U.S. Cl. 339—17 M **2 Claims**



1. A latch device for removably mounting stacked circuit boards in a cabinet comprising a main body section, securing assembly means formed with an aperture and adapted to mount to said main body section and pin assembly means mounted for vertical movement through said main body section, said main body section comprising a forward body section including a flat upper plate formed with a projecting cylindrical member, two downwardly projecting laterally spaced flexible side members integrally formed with said flat upper plate on the proximate end and each terminating at shoulder means on the distal end of said side members and a rear body section including a flat top member formed with two downwardly projecting laterally spaced legs terminating at said flexible side members of said forward body section at said shoulder means, said pin assembly means comprising a shaft member, a circular flat member formed at one end thereof and flexible fingers formed at the other end thereof, said main body section adapted to be mounted to a first circuit board by inserting said cylindrical member through an aperture in a first circuit board so that said cylindrical member projects through the top of said first circuit board, said securing assembly means adapted to be installed over said cylindrical section and secured with a conventional lock nut and said pin assembly adapted to be inserted through the top of said cylindrical section, said latch device adapted to be similarly assembled to multiple circuit boards to be stacked such that said shoulder means of a first main body section located on said first circuit board is adapted to engage said securing assembly installed on a second circuit board to secure said first circuit board to said second circuit board, said shoulder means of said first main body section further adapted to be disengaged from said securing assembly of said second circuit board by applying a downward axial force on said pin assembly associated with said latch device on said first circuit board while simultaneously applying an upward force on said flat top member of said rear body section mounted on said first circuit board causing said side members to flex and disengage said shoulder means of said first main body section from said securing assembly means on said second circuit board to disengage said first circuit board from said second circuit board.

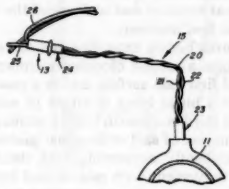
4,544,218

ELECTRICAL ORNAMENTATION SYSTEM

Robert E. Sanders, Lenexa, Kans.; Jerry L. Knipp, Grandview, and Charles J. Flynn, Kansas City, both of Mo., assignors to Hallmark Cards, Inc., Kansas City, Mo.

Filed Jun. 27, 1983, Ser. No. 508,522
Int. Cl.⁴ H01R *29/00*
U.S. Cl. 339—31 L **10 Claims**

1. A connector for electrical connection of a lighted decorative ornament in a string of conventional sockets for miniature Christmas lights or the like, the lighted decorative element having electrical characteristics like those of a single miniature Christmas light, each of said conventional sockets including a hollow housing of insulating material having an open end with a pair of contacts within said housing arranged for engagement with contacts of a conventional miniature Christmas light and interconnected through flexible conductors with contacts of other conventional sockets of said string, said connector being arranged for connection to a selected socket of a string of conventional sockets mounted in a stationary position on a tree and said connector being arranged to provide an extension cord to obtain flexibility and mobility in the placement of a lighted decorative element on the tree with respect to said string of stationary conventional sockets, said connector comprising: an elongated flexible cable having at least two conductors, first connection means at one end of said cable for connection of said conductors thereof to said lighted decorative orna-



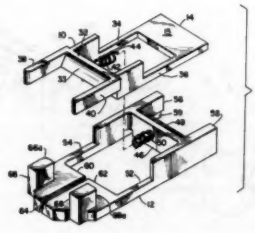
ment, and second connection means at the opposite end of said elongated flexible cable for connection of said conductors thereof to contacts of a selected one of said conventional sockets, said second connection means including a member of insulating material and contact means carried by said member to form a plug assembly arranged to fit within the hollow housing of said one of said conventional sockets and to electrically connect said conductors of said cable with the contacts of said selected one of said conventional sockets, said lighted decorative element being thereby connected electrically in said string in place of a light which might otherwise be inserted in said selected one of said conventional sockets and said lighted decorative ornament being thereby movable to any desired position on said tree within the length of said flexible cable from said selected one of said stationary conventional sockets.

4,544,219

SHUTTERED ELECTRICAL RECEPTACLE

Emanuel E. Barkas, Branford, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jun. 1, 1984, Ser. No. 616,070
Int. Cl.⁴ H01R *13/447*
U.S. Cl. 339—40 **20 Claims**



1. A shutter mechanism for use in a receptacle of the type having a faceplate with slots therethrough shaped and dimensioned to permit the passage of plug blades wherein one blade lies in a first plane and a second blade lies in one of two orthogonal planes, the mechanism comprising the combination of

first and second relatively movable shutter members;

spring means for urging each of said shutter members toward a normal location in the absence of inserted plug blades;

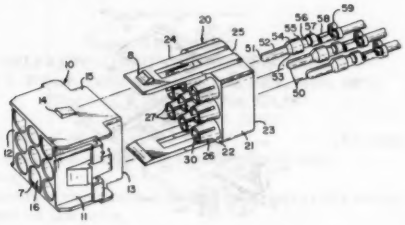
said first shutter member including
a first blocking member having a surface lying in a position to block the path of a blade in said first plane in said normal location;
a first body having a first inclined cam surface lying in the path of a blade lying in one of said two orthogonal planes, said cam surface facing away from said first member;
means for substantially rigidly interconnecting said first blocking member and said first body: and
means defining first and second substantially parallel, inwardly facing surfaces generally aligned with the opposite ends of said first cam surface;
said second shutter member including
a second body having a second cam surface lying in the path of a blade lying in either of two orthogonal planes in its normal location and in front of the blocking surface of said first member;
third and fourth bodies extending toward each other to together form a second blocking member lying partly behind said first cam surface and in a position to block the path of a blade lying in either of said orthogonal planes, said third and fourth bodies meeting along a line contained in one of said orthogonal planes;
means for resiliently supporting said third and fourth bodies for movement with said second body;
third and fourth projections extending away from said third and fourth bodies and between said first and second parallel, inwardly facing surfaces to hold said third and fourth bodies together in said normal location;
said first and second cam surfaces being contactable by the concurrent entry of plug blades to move said shutter members so that said first and second blocking members move away from the paths of blades lying in parallel planes,
said first and second parallel surfaces being positioned so that said third and fourth projections are released by said surfaces when the inserted blades approach said blocking members, thereby permitting said third and fourth bodies to separate and admit a perpendicular blade therebetween.

4,544,220

CONNECTOR HAVING MEANS FOR POSITIVELY SEATING CONTACTS

Richard E. Aiello, Winston-Salem; Stanford C. Moist, Jr., Kernersville; Robert J. Poleshuk, Greensboro, and Timothy C. Wildman, Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 28, 1983, Ser. No. 566,233
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—59 M **3 Claims**



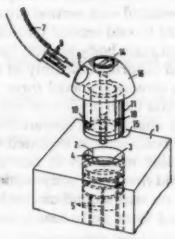
1. An electrical connector assembly comprising:
a housing having a forward face and a rearward face, said forward face being constructed for mated connection with a complementary housing of another connector assembly, a plurality of cavities extending between said forward face and said rearward face;
a retainer having a forward face and a rearward face, said retainer having projecting from the forward face thereof a plurality of contact engaging means arranged for entry in respective cavities at the rearward face of said housing, each engaging means comprising a plurality of resilient contact engaging fingers situated radially about a passage which extends from the rearward end of said retainer to the distal ends of said fingers each resilient finger being sufficiently expandable to stub the rearward face of said housing adjacent a corresponding housing cavity, each said passage having a first diameter at said forward face and a second more restricted diameter toward the distal ends of said fingers;
a plurality of elongate contacts each having a mating portion at one end, a wire connecting portion at the other end, and a bearing portion therebetween, said bearing portion being bounded by the mating portion at a shoulder facing away from said one end, said mating portion being smaller than said first diameter, said bearing portion having a diameter equal to or smaller than said first diameter but larger than said second diameter, the diameter of the bearing portion being sufficient to engage the resilient fingers and expand the resilient fingers to stub the rearward face of said housing adjacent a corresponding housing cavity, whereby,
upon moving one of said contacts through one of said passages from the rearward face of the retainer, said bearing portion will urge said resilient fingers apart as it approaches the distal ends thereof, said fingers at this stage precluding entry of said engaging means into a respective cavity at the rear face of said housing, and upon moving said contacts further through said passage until said bearing portion passes the distal ends of the fingers, said ends will return resilient to engage said shoulder, whereby said forward face of said retainer cannot be mated against said rearward face of said housing unless contacts in passages are fully inserted, and said contact cannot back out when fully inserted.

4,544,221

CABLE LEAD-IN FOR ENCAPSULATED ELECTRICAL EQUIPMENT

Werner Schaller, Lampertheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,896
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1982, 3204414
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—60 M **7 Claims**



1. A cable lead-in arrangement for encapsulated electrical equipment, the arrangement being of the type having an elastically compressible sealing member which surrounds the cable and is braced between the cable and a housing of the equipment, the arrangement further comprising:
a contact element inserted in the housing of the equipment for contacting conductor elements of the cable which are arranged to extend through the sealing member, said contact element being incorporated in a flexible circuit encapsulated in foam; and
compression means for applying a compression force to the sealing member, said sealing member being provided with

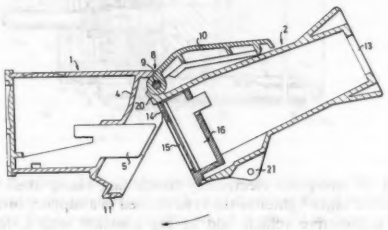
insertion openings through which are inserted said conductor elements of the cable so as to protrude to the surface region of the sealing member, the arrangement being provided with an entrance opening for entry of the cable.

4,544,222

ELECTRICAL CONTACT

Ove Andersson, Oxhagsgatan 106, S-561 50 Huskvarna, Sweden

Filed Jun. 17, 1983, Ser. No. 505,239
Claims priority, application Sweden, Jun. 24, 1982, 8203951
Int. Cl.⁴ H01R *13/62*
U.S. Cl. 339—75 M **11 Claims**



1. An electrical contact comprising;
first and second contact parts for detachably connecting to each other,
the first contact part comprising:
a first cover having a first side for facing the second contact part;
a shoulder on the first cover; and
first contact means mounted to the first cover and disposed on the first side thereof;
the second contact part comprising:
a second cover having a second side for facing the first side of the first contact part;
second contact means mounted to the second cover and disposed toward the second side thereof for contacting the first contact means; and
a section on the second cover for fitting against the shoulder of the first contact part, the second contact part defining a lever around the section for moving the second contact part relative to the first contact part from a disconnected position in which the second side is away from the first side of the first contact part to a connection position in which the second side faces the first side, thereby bringing the first and second contact means into electrical contact;
the first and second contact means each comprising a plurality of pins, each pin of the first contact means being arranged for making electrical contact with a corresponding pin of the second contact means when the second contact part is moved to the connected position;
the second contact part further comprising spring means for pushing each pin of the second contact means against the corresponding pin of the first contact means;
the spring means comprising a plurality of leaf-springs, each mounted to the second contact part adjacent a corresponding pin of the second contact means.

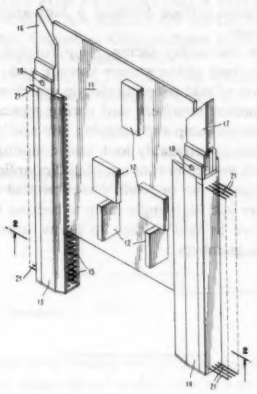
4,544,223

ACTUATOR FOR ZERO INSERTION FORCE CONNECTORS

John B. Gillett, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,702
Int. Cl.⁴ H01R *13/631*
U.S. Cl. 339—75 MP **24 Claims**

1. A zero insertion force type edge connector for electrically engaging at least one edge of an electronic component comprising:
a first and a second base portion supporting a first and a second housing respectively, at least one housing having at least one row of electrical contacts therein;
an elongated slot in each of said housings for receiving an edge of said electronic component;
actuator means;



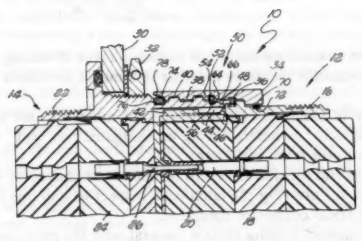
first means responsive to said actuator means for moving said electronic component to a fixed position; and
second means responsive to said actuator means for moving said at least one row of electrical contacts toward said electronic component after said electronic component is moved to said fixed position, whereby said contacts engage and wipe electrical contact areas on said electronic component.

4,544,224

SELF-LOCKING ELECTRICAL CONNECTOR

David S. Goodman, Mission Viejo; Gerald J. Selvin, Huntington Beach; Hubert W. Naus, Monrovia; David Rofer, Fountain Valley, and Randy A. McNutt, Fullerton, all of Calif., assignors to International Telephone & Telegraph Corp., New York, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,362
Int. Cl.⁴ H01R *13/639*
U.S. Cl. 339—89 M **20 Claims**



1. An electrical connector comprising:
first and second mating connector members;
each said connector member comprising a shell surrounding an insert containing a contact adapted to engage the contact in the other connector member;
a rotatable coupling ring on one of said shells adapted to couple with the other shell;

the interior of said coupling ring and the exterior of said other shell forming inner and outer concentric surfaces;

an annular groove formed in each of said surfaces, said grooves being axially aligned when said connector members are fully mated by said coupling ring;

radially deformable annular spring means lying in both of said grooves when said connector members are fully mated;

the groove in one of said concentric surfaces providing a front annular surface forming a high-angle rearwardly facing ramp;

a low-angle forwardly facing ramp formed on said one surface in front of the groove therein; and

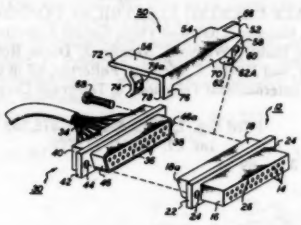
upon rotation of said coupling ring in one direction to mate said connector members said spring means riding over said low-angle ramp and snapping into said groove in said one surface to releasably lock said coupling ring to said other shell, and upon rotation of said coupling ring with a high torque in the opposite direction said spring means riding over said high-angle ramp to become released from said groove in said surface to allow unmating of said connector members.

4,544,225

CONNECTOR LATCH

Robert W. Raus, Fairport, and Sam E. Stewart, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 21, 1984, Ser. No. 623,042
Int. Cl.[4] H01R *13/631*
U.S. Cl. 339—91 R **7 Claims**



1. A connector assembly for securing a pair of mating electrical connector members together in a mated condition comprising

a pair of mating electrical connector members, one of the connector members having an elongated rim, and

a connector latch including

a pivot end secured to one of the electrical connector members for pivoting the latch with respect to said one of the electrical connector members,

an elongated locking section integral with the pivot end for engaging the elongated rim, and

a clamp end having a spring portion for snapping the latch onto the connector members, the clamp end being a U-shaped section with a tab for grasping the connector latch to open and close the connector latch,

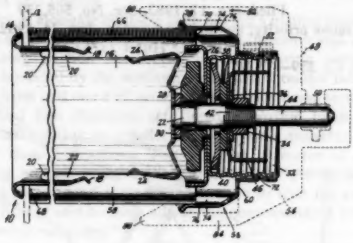
one leg of the U-shaped section being an S-shaped spring, the other leg of the U-shaped section being an essentially straight clamp with a beveled edge.

4,544,226

TWO-PIECE CLAMP SHELL FOR ELECTRIC CIGAR LIGHTER

Peter J. Lupoli, Hamden, and John J. Comerford, Stamford, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Apr. 9, 1984, Ser. No. 597,833
Int. Cl.[4] H01R *13/74*
U.S. Cl. 339—130 R **18 Claims**



1. A two-piece electrically-conducting clamp shell for an electric cigar lighter of the type carried in a support surface of an automotive vehicle and having a socket with a threaded inner end, and adapted to be connected with a current-carrying snap-on fitting of the vehicle's electrical system, said fitting being of the type having clip means for holding the fitting in position when snapped onto the cigar lighter socket, said clamp shell comprising, in combination:

(a) a tubular body generally surrounding the cigar lighter socket and having a forward edge portion adapted to engage the rear face of the support surface that carries the lighter,

(b) said body having a rear edge portion,

(c) an electrically-conducting nut having a thread engageable with the threaded inner end of the cigar lighter socket,

(d) said nut having an abutment forward of the thread and engageable with at least parts of the rear edge portion of the tubular body when the nut is threaded on the socket, thereby to apply pressure to the said rear edge portion, and

(e) means on the nut providing a continuous, forwardly-facing shoulder, any selected peripherally-spaced portions of which are adapted for engagement by the clip means of the current-carrying fitting associated with the socket for the purpose of retaining said fitting against axial dislodgement, whereby the rotative position of the nut is immaterial as regards the retention of said fitting thereon.

4,544,227

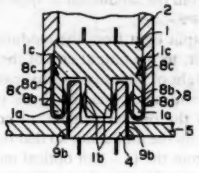
SHIELDED ELECTRICAL CONNECTOR

Takao Hirose, Mibu, Japan, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 19, 1982, Ser. No. 409,479
Claims priority, application Japan, Sep. 3, 1981, 56-130370[U]
Int. Cl.[4] H01R *13/648*
U.S. Cl. 339—143 R **6 Claims**

1. A first electrical connector adapted for shielded intermating with a second electrical connector where the second electrical connector has a body of dielectric material having an elongated rectangular shape and supporting a first set of electrical contacts, with the outer peripheral surface of the dielectric body being surrounded by an electrically conductive grounding shell, said first electrical connector having a body of dielectric material supporting a second set of electrical contacts adapted to be mated with the first set of electrical contacts, said first electrical connector being characterized in that an electrically conductive housing shell member surrounds a substantial portion of the outer peripheral surface of

the first connector dielectric body, said dielectric body having an elongated rectangular shape and an elongated rectangular recess in the mating face thereof for receiving said second electrical connector and two elongated conductive spring shield members separate from said shell and held by said shell member and electrically connected thereto arranged oppositely and extending from said shell member along the respective peripheral surface of said first connector dielectric body towards the mating face thereof and around the outer edge of the recess therein into and along the inner wall of the recess so that the shell of the first connector is electrically connected to



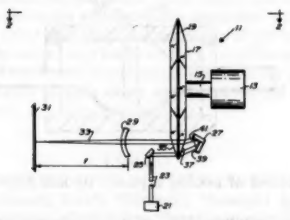
the grounding shell of the second connector when the two connectors are intermated, each of said spring shield members having a flat connecting section which is placed in close juxtaposition to the outer peripheral surface of said first connector dielectric body and an arcuate contact section which bridges the mating end surface of the wall surrounding said recess and extends into the recess against the inner wall thereof, a portion of said flat connecting section being sandwiched between the inner surface of said shell and the outer surface of said dielectric body to hold said spring shield member against said dielectric body.

4,544,228

SCANNING METHOD USING A ROTATING PRISM

Joseph F. Rando, Los Altos Hills, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 14, 1982, Ser. No. 417,926
Int. Cl.⁴ G02B *27/17*
U.S. Cl. 350—6.4 **11 Claims**



1. A scanning apparatus for repeatedly scanning a beam of light in a single same direction and from the same starting point, said apparatus comprising,

light beam means for producing a collimated monochromatic light beam,

a prism wheel having a plurality of light deflecting prism facets on the periphery of the wheel and wherein all of the prism facets have substantially the same prism angle,

rotating means for rotating the wheel and the prism facets about an axis of rotation passing through the center of the wheel,

routing means for routing the light beam onto a front face of each prism facet as the wheel and the peripheral prism facets are rotated past the routing means, and

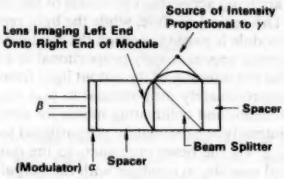
porro prism means for receiving the deflected beam exiting the back face of the prism facet and for reflecting the beam back through the prism facet so that the beam makes two passes through each prism facet rotating past the routing means and wherein the plurality of prism facets having the same prism angle are effective to produce a plurality of scanned beams each starting from the same starting point and each scanned in the same, single direction without retracing.

4,544,229

APPARATUS FOR EVALUATING A POLYNOMIAL FUNCTION USING AN ARRAY OF OPTICAL MODULES

Carl M. Verber, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 19, 1983, Ser. No. 459,167
Int. Cl.⁴ G02B *5/14, 5/172*
U.S. Cl. 350—96.14 **20 Claims**



1. Apparatus for providing an optical analog intensity that is approximately proportional to the value of a polynomial function expressible in the form

$$p(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_2 x^2 + a_1 x + a_0$$

$$= ((((a_n x + a_{n-1})x + a_{n-2})x + \cdots + a_2)x + a_1)x + a_0$$

wherein

p(x) is a function of x,

x is any variable,

n is any positive integer, the cooefficients, a_i, are any constants, variables, or constants and variables;

comprising:

an electrooptic planar waveguide;

a plurality, n+1, of integrated optical modules in the waveguide, each module comprising at its input end a modulator for receiving light travelling in a predetermined input direction and transmitting a controlled proportion thereof further in a predetermined output direction to the output end, and a beam combiner for receiving the light from the modulator and transmitting a predetermined proportion thereof further in the predetermined output direction and on through the output end of the module;

the modulator comprising electrooptic diffractive means comprising a pair of electrodes for forming a Bragg grating therebetween, positioned with a direction of Bragg incidence approximately in the predetermined input direction, the first electrode comprising a first set of substantially straight and parallel, thin, elongate, electrically conductive members connected together at one end, and the second electrode comprising a second set of substantially straight and parallel, thin, elongate, electrically conductive members, interleaved with the first set, insulated therefrom, and connected together at the opposite end, so that when a first electrical potential is applied to the first electrode and a second electrical potential is applied to the second electrode the controlled portion of input light transmitted through the modulator is provided by a Bragg diffraction thereof in the predetermined output direction and has an intensity approximately proportional to a known function of the difference between the first and second electrical potentials; and the beam combiner comprising a fixed surface grating;

diode laser means and collimating means for directing input

light of intensity approximately proportional to the coefficient a_n to the input end of the nth optical module;

means for applying across the electrodes of the modulator, while the light is passing through the modulator, a potential difference approximately proportional to a function of x such that the intensity of the output light from the modulator is approximately proportional to a_nx;

diode laser means and collimating means for directing input light of intensity approximately proportional to the coefficient a_{n-1}, via the beam combiner, to the output end of the optical module, to combine with the output light from the modulator so that the intensity of the output light from the nth optical module is approximately proportional to a_nx+a_{n-1};

the (n−1)th optical module being positioned to receive the output light from the nth optical module in the predetermined input direction of the (n−1)th module;

means for applying across the electrodes of the modulator in the (n−1)th optical module, while the light received from the nth module is passing through the modulator, a potential difference approximately proportional to a function of x such that the intensity of the output light from the modulator is approximately proportional to $(a_nx+a_{n-1})x$;

diode laser means and collimating means for directing input light of intensity approximately proportional to the coefficient a_{n-2}, via the beam combiner, to the output end of the optical module, to combine with the output light from the modulator so that the intensity of the output light from the (n−1)th optical module is approximately proportional to $(a_nx+a_{n-1})x+a_{n-2}$;

and so on, in the same manner, and finally to the zeroth optical module, so that the intensity of the polynomial function output light from the zeroth optical module is approximately proportional to

$$((((a_nx+a_{n-1})x+a_{n-2})x+ \cdots +a_2)x+a_1)x+a_0.$$

4,544,230

METHOD OF EVALUATING A POLYNOMIAL FUNCTION USING AN ARRAY OF OPTICAL MODULES

Henry J. Caulfield, Nagog Woods, Mass., assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 19, 1983, Ser. No. 459,168
Int. Cl.⁴ G02B 5/14, 5/172
U.S. Cl. 350—96.14 **13 Claims**

1. A method for providing an optical analog intensity that is approximately proportional to the value of a polynomial function expressible in the form

$$p(x) = a_nx^n + a_{n-1}x^{n-1} + \cdots + a_2x^2 + a_1x + a_0$$

wherein $((((a_nx + a_{n-1})x + a_{n-2})x + \cdots + a_2)x + a_1)x + a_0$

p(x) is a function of x,

x is any variable,

n is any positive integer,

the coefficients, a_i, are any constants, variables, or constants and variables;

comprising:

directing input light of intensity approximately proportional to the coefficient a_n to the input end of an nth optical module comprising at the input end a modulator whose output light intensity is approximately proportional to a known function of an electrical potential difference across it and at the output end a beam combiner,

applying across the modulator, while the light is passing through it, a potential difference approximately proportional to a function of x such that the intensity of the output light from the modulator is approximately proportional to a_nx,

directing the output light from the modulator, through the beam combiner, to the output end of the optical module,

directing input light of intensity approximately proportional to the coefficient a_{n-1}, via the beam combiner, to the output end of the optical module, to combine with the output light from the modulator so that the intensity of the output light from the nth optical module is approximately proportional to a_nx+a_{n-1},

directing the output light from the nth optical module to the input end of an (n−1)th optical module essentially similar to the nth,

applying across the modulator in the (n−1)th optical module, while the light received from the nth module is passing through it, a potential difference approximately proportional to a function of x such that the intensity of the output light from the modulator is approximately proportional to $(a_nx+a_{n-1})x$,

directing the output light from the modulator, through the beam combiner, to the output end of the optical module,

directing input light of intensity approximately proportional to the coefficient a_{n-2}, via the beam combiner, to the output end of the optical module, to combine with the output light from the modulator so that the intensity of the output light from the (n−1)th optical module is approximately proportional to $(a_nx+a_{n-1})x+a_{n-2}$,

and so on, in the same manner, and finally to the first optical module, so that the intensity of the polynomial function output light from the first optical module is approximately proportional to

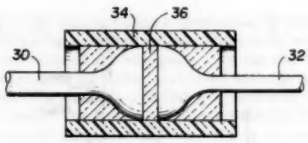
$$((((a_nx+a_{n-1})x+a_{n-2})x+ \cdots +a_2)x+a_1)x+a_0.$$

4,544,231

METHOD OF JOINING PLASTIC OPTICAL FIBERS AND CONNECTIONS OBTAINED

John I. Peterson, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 509,819
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.15 **16 Claims**



1. A method of making a plastic optical fiber connection, comprising:

providing non-wettable first tubular means, and first and second optical fibers;

placing one end of each of said first and second fibers in said tubular means;

heating the ends of the fibers within said tubular means to cause said fibers to expand and fill the inside diameter of said tubular means, and, when said fiber ends have been placed in said tubular means in a side-by-side relationship, fusing said fiber ends;

causing the expanded end of said first optical fiber to be within a tubular sleeve so that a space remains within said tubular means;

filling the space remaining within said tubular sleeve with ultraviolet-curing optical cement;

contacting, within said tubular expanded end of said sleeve, said second fiber with said optical cement; and

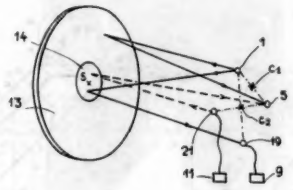
curing said cement.

4,544,232

COUPLING-EXTRACTING DEVICE FOR OPTICAL SIGNAL

Jean-Pierre Laude, Saclas, France, assignor to Instruments S.A., France

Filed Apr. 28, 1982, Ser. No. 372,716
Claims priority, application France, Apr. 30, 1981, 81 08636
Int. Cl.⁴ G02B *5/14, 5/10, 5/18*
U.S. Cl. 350—96.15 **15 Claims**



1. An optical coupling and extracting device, comprising:
(a) a first reflective member having a first reflective surface with a first area, said first reflective member having a first center of curvature at a first position in space with respect to said first reflective surface;
(b) a second reflective member secured with respect to said first reflective member, said second reflective member having a second reflective surface with a second area and a second center of curvature at a second position in space with respect to said first reflective surface, said second position being different from said first position and said second position being on the same side of first reflective member as said first center of curvature;
(c) an input port positioned at a first point in space said first point being on the same side of said first reflective surface as said first center of curvature;
(d) an output port positioned at a second point in space, said first and second points being symmetrically positioned with respect to each other about said first center of curvature, said second position in space lying off a line defined between said first and second points;
(e) an injection port positioned at a third point in space, said third point being on the same side of said second reflective surface as said second center of curvature, said second and third points being symmetrically positioned with respect to each other about said second center of curvature; and
(f) a sample output port positioned at a fourth point in space, said first and fourth points being symmetrically positioned with respect to each other about said second center or curvature.

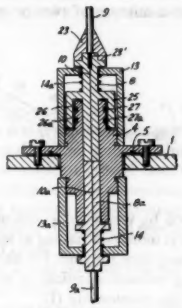
4,544,233

UNDERWATER OPTICAL FIBER CONNECTOR

Yoshinao Iwamoto; Yuichi Shirasaki; Masayuki Fujise, and Kenichi Asakawa, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,518
Claims priority, application Japan, Dec. 5, 1981, 56-195972
Int. Cl.⁴ G02B *7/26*
U.S. Cl. 350—96.20 **6 Claims**

1. A water-tight optical fiber connector comprising: a receptacle inserted in a water-tight container to be fixed integrally therewith; an annular, first sealing member for sealing said water-tight container and interposed between said receptacle and said water-tight container; an internal plug fixedly engaged with said receptacle in a manner to allow free attachment/detachment from inside said water-tight container and connected to ends of optical fiber cables in the water-tight container so as to have the center line of the optical fibers penetrate at the center thereof; an outer plug engaged with said receptacle in a manner to allow free attachment/detachment from outside said water-tight container to oppose said internal plug and connected to ends of optical fiber cables outside said water-tight container so as to have the center line of the optical fibers penetrate at the center thereof; pressing means screwed from outside said water-tight container into said receptacle for pushing said outer plug into said receptacle for fixation so as to



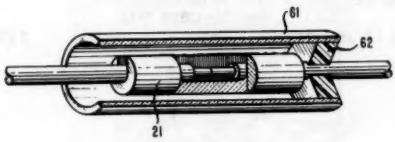
make the opposing end surfaces of said internal plug and said outer plug abut each other; and a second sealing member interposed between said receptacle and said outer plug and communicating with the inside of said water-tight container for sealing the gap therebetween.

4,544,234

LOW LOSS OPTICAL FIBER SPLICING

George F. DeVeau, Jr., Stone Mountain, and Calvin M. Miller, Lilburn, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 9, 1982, Ser. No. 367,120
Int. Cl.⁴ G02B *5/14*
U.S. Cl. 350—96.21 **9 Claims**



1. A method of splicing optical fibers characterized by steps comprising obtaining two optical fibers having substantially flat endfaces which are substantially perpendicular to the axis of the fiber, placing the fiber ends in proximity, surrounding said ends with a first slotted glass tube that does not touch said fiber ends, with said slotted tube being at least partially filled with cement, directing radiation through at least one of said fibers, aligning the cores of said fibers by minimizing the amount of radiation scattered from said ends, and curing said cement by directing ultraviolet radiation through said tube, whereby a splice with improved thermal stability results.

4,544,235

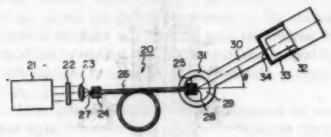
PLASTIC OPTICAL FIBERS

Kozi Nishida, Otake, and Takashi Yamamoto, Hiroshima, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 504,877
Claims priority, application Japan, Jul. 5, 1982, 57-116482; Jul. 7, 1982, 57-118014; Jul. 8, 1982, 57-119075
Int. Cl.⁴ D02G *3/00;* B29D *11/00*
U.S. Cl. 350—96.34 **17 Claims**

1. A plastic optical fiber comprising a core and a cladding,

wherein said core comprises a transparent polymer material (1); and said cladding comprises a transparent copolymer (2) comprising about 20 to 99.95% by weight of a comonomer (A) selected from the group consisting of fluoroalkylacrylates wherein the alkyl radical has from 1 to 12 carbon atoms, fluoroalkylmethacrylates wherein the alkyl radical has from 1 to 12 carbon atoms, and a mixture of two or more of these com-



pounds; 0.05 to 10% by weight of a comonomer (B) comprising at least one vinyl monomer having at least one hydrophilic radical, wherein said core polymer (1) and said cladding copolymer (2) having refractive indices n_1 and n_2, respectively, and which satisfy the relationship (I):

$$n_1 - n_2 \geq 0.01 \quad \text{(I)}.$$

4,544,236

TURRET

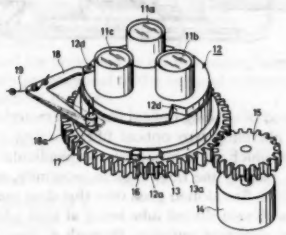
Itaru Endo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,756

Claims priority, application Japan, Nov. 2, 1981, 56-163872[U]; Nov. 2, 1981, 56-163873[U]

Int. Cl.⁴ G02B *7/16*

U.S. Cl. 350—247 **3 Claims**



1. A turret comprising a rotatable turret board holding thereon a plurality of lenses of different magnifications and having a plurality of notches serving as position indexes on the peripheral edge thereof each adjacent to a said respective lenses, a locking member formed as a two-arm lever one arm of which is engageable with any one of said plurality of notches to lock said turret board, a driving plate operatively connected to said turret board so as to be relatively rotatable by a predetermined range to rotate said turret board, a driving motor connected to said driving plate to rotate said driving plate, and a detecting element set near said turret board and cooperating with the other arm of said two-arm lever to issue a signal for stopping said driving motor when the one arm of said two-arm lever engages with one of said plurality of notches to lock said turret board and said other arm including a tip part.

4,544,237

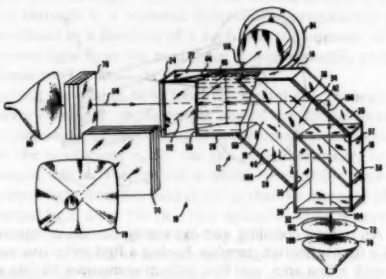
HIGH EFFICIENCY OPTICAL TANK FOR TWO-COLOR LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTION WITH COLOR SELECTIVE PREPOLARIZATION

Ralph J. Gagnon, Chico, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,681

Int. Cl.⁴ G02F *1/13*; G03B *21/00*

U.S. Cl. 350—331 R **13 Claims**



10. A unitary arrangement comprising:

a first polarizing beamsplitter for substantially splitting and polarizing light from a source into first and second beams having S and P polarization states, respectively;

a first dichroic separator for substantially extracting red light from said first beam;

a second dichroic separator for substantially extracting green light from said second beam;

means for combining the outputs of said first and second dichroic separators into a single beam; and

a second polarizing beamsplitter for polarizing the single beam and directing red light to a first surface and green light to a second surface, wherein the first and second polarizing beamsplitters have transverse axes and each beamsplitter is mounted so that the beamsplitter transverse axes are oriented at a relative 90° angle.

12. The unitary arrangement of claim **10** including mirror means for directing the outputs of said first and second separators to said means for combining the outputs of said first and second separators.

4,544,238

SUBSTRATE HAVING DUMMY CONDUCTORS TO PREVENT SOLDER BUILD-UP

Friedrich W. Nickol, Eppstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,396

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211408

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—336 **19 Claims**

1. In a substrate having a conductor path of solderable material arranged thereon and having a solder layer applied to the conductor path by contact as the conductor path moves along molten solder material, the improvement comprising

on the substrate, close alongside of the conductor path, at least one dummy conductor path is disposed corresponding in construction to said first mentioned conductor path.

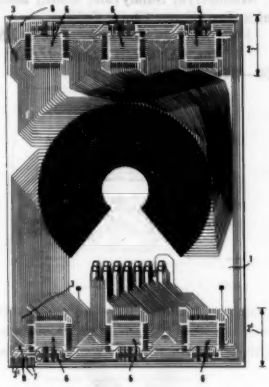
16. A method of constructing an electrical circuit on a substrate comprising the steps of:

arranging solderable material on the substrate along the paths of an array of electrical conductors to be formed on the, substrate, the substrate being electrically insulating and nonadhesive to solder material,

placing further solderable material on said substrate in an

arrangement of paths for dummy electrical conductors in peripheral regions of said array of electrical conductors, and

dipping said substrate into molten solder material for coating said solderable material with the solder material to construct said electrical conductors, said electrical conductors being formed of said solderable material, said dipping being accomplished by passing said substrate through said molten solder material with said array of electrical conductors being removed from said molten solder prior to removal of said dummy conductors to prevent buildup of excess solder material on said array of electrical conductors.

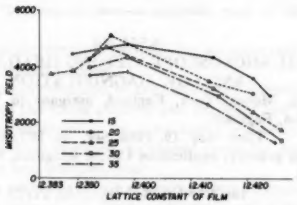


4,544,239

COMPRESSED BISMUTH-CONTAINING GARNET FILMS OF REPLICABLE LOW ANISOTROPY FIELD VALUE AND DEVICES UTILIZING SAME

Michael F. Shone, Parsippany, and Roger F. Belt, Morristown, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Mar. 16, 1983, Ser. No. 475,937
Int. Cl.[4] G02F *1/09*; C04B *35/40*
U.S. Cl. 350—376 **298 Claims**



1. A magnetically switchable magneto-optic element of high Faraday rotation comprising a monocrystalline gadolinium garnet substrate and an epitaxial film supported by said substrate, said epitaxial film being nominally represented by the formula:

$$Bi_xM_{3-x-z}Q'_zFe_{5-y-z}Ga_yQ_zO_{12}$$

wherein:

M is selected from the group consisting of Dy, Ho, Er, Tm, Yb, Lu, Y, Sm, Gd and combinations thereof;

Q is selected from the group consisting of Mn^{3+}, In^{3+}, Sc^{3+}, Sb^{3+}, Al^{3+}, Ge^{4+}, V^{5+} and combinations thereof;

Q′ is a charge-balancing cation having a valence lower than 3+ which is present where Q is comprised of a cation having a valence higher than 3+, Q′ being present in an amount such that charge balance is maintained;

the values of x, y, z and z′ are as follows:

$0 < x \leqq 1.9$

$0 \leqq y \leqq 1.35$

$0 \leqq z \leqq 1.0$

$0 \leqq z' \leqq 1.0$

$y+z \leqq 1.4$

the epitaxial film is in compression caused by lattice differential between substrate and epitaxial film, said epitaxial film having a lattice constant greater than said substrate;

the combination of the cations comprising said epitaxial film provides a net negative magneto-strictive coefficient;

the anisotropy field of the epitaxial film is a positive value up to about 8,000 gauss;

the collapse field of said epitaxial film has a positive value up to about 120 oersteds; and,

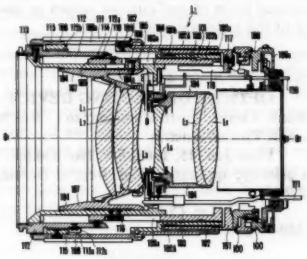
the Faraday rotation of said epitaxial film is at least about 0.7 degrees per micron at 632 nm.

4,544,240

SOFT FOCUSING LENS ASSEMBLY

Seiichi Shimizu, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,893
Claims priority, application Japan, Mar. 4, 1981, 56-30844; Sep. 10, 1981, 56-142640
Int. Cl.[4] G02B *13/20*
U.S. Cl. 350—429 **3 Claims**



1. A lens assembly comprising:

(a) first and second lens holder members containing first and second lenses for focusing respectively and defining an optical axis;

(b) an actuator member capable of a rotative operation about said optical axis of said lenses and a linear operation along said optical axis;

(c) a linear moving member responsive to rotation of said actuator member for linear movement;

(d) lens moving means operative upon engagement with said linear moving member to adjust the distance between said first and said second lens holder members in accordance with the movement of said moving member thereby to perform a focusing operation;

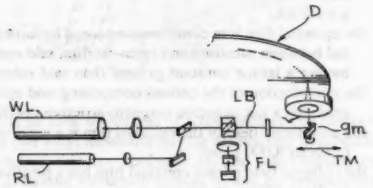
(e) means for moving said first lens holder member to change the aberration of said lens assembly, said means connecting said actuator member and said first lens holder member with each other and being responsive to linear movement of said actuator member for moving said first lens holder member so that said lens assembly is set in a position where the aberration thereof is changed.

4,544,241

MIRROR POSITION SENSOR AND ASSOCIATED MOTOR FOR IMPROVED TRACK SELECTION IN OPTICAL DATA DISK SYSTEM

Edward V. LaBudde, Newbury Park, and Jeffrey E. Niven, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 30, 1982, Ser. No. 430,235
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—486 20 Claims



1. An improved apparatus to selectively and controllably pivot a reflector means, the apparatus including:

magnetic motor means comprising at least one low-reluctance magnetic circuit means formed to surround a prescribed "pivot-zone" including the reflector means, plus associated pole means and coil means; the reflector means being mounted pivotingly and relatively centrally in this zone and including magnetizable means;

said pole means being disposed opposingly about the so-mounted reflector means, in low-reluctance coupling with said circuit means;

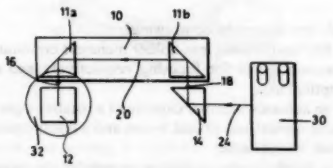
said coil means being disposed about the reflector means and in inductive-relation with said pole means whereby a prescribed pulse of coil-current causes an associated pivoting of the reflector means.

4,544,242

OPTICAL DEFLECTING DEVICE

Klaus Schindl, Vienna, Austria, assignor to C. Reichert Optische Werke AG, Vienna, Austria

Filed Jun. 15, 1983, Ser. No. 504,655
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222816
Int. Cl.[4] G02B *21/36*
U.S. Cl. 350—486 1 Claim



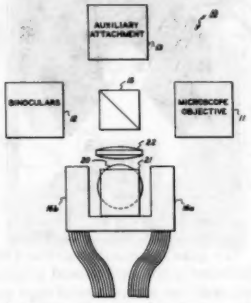
1. A microscope projection system comprising a microscope, a microscope exit axis having a portion extending in a upwardly vertical direction, a projection screen horizonally spaced from said microscope, a downwardly extending vertical entrance axis, a deflector to direct light from said entrance axis to said screen and a horizonally extending optical bridge connecting said portion of the exit axis to said entrance axis, said optical bridge having two reflective surfaces, one of said reflective surfaces deflecting light received from said portion in a horizonal direction and the other reflective surface deflecting light received from said one reflective surface along the projection of said entrance axis, said optical bridge being rotatable about said portion and said projection screen being rotatable about said entrance axis.

4,544,243

HEADS UP DISPLAY FOR MICROSCOPE USING REMOTELY CONTROLLED INSTRUMENT

Charles R. Munnerlyn, Sunnyvale, Calif., assignor to Cooper Lasersonics, Inc., Santa Clara, Calif.

Filed May 24, 1984, Ser. No. 613,526
Int. Cl.[4] G02B *21/00, 27/10*
U.S. Cl. 350—514 14 Claims



1. A heads up display of information relevant to a remote instrument used in association with a microscope having a microscope objective, binoculars, and an essentially collimated light region between said microscope objective and said binoculars, said heads up display comprising:

a. a beam splitter arranged between said microscope objective and said binoculars;

b. an electronic digital display of numbers relevant to a control setting for said remote instrument;

c. said digital display being arranged off the optical axis of said microscope;

d. a convex mirror arranged for viewing said digital display;

e. a collimating lens arranged for collimating diverging light from said convex mirror enroute to said beam splitter; and

f. collimated light from said lens being incident on said beam splitter to position an image of said digital display in a marginal region of the apparent field of one of said binoculars.

4,544,244

OPTICAL MICROSCOPE VIEWING HEAD WITH HIGH AND LOW MAGNIFICATION

Derek S. Moore, York, England, assignor to Vickers PLC, London, England

Filed Mar. 19, 1984, Ser. No. 591,198
Claims priority, application United Kingdom, May 26, 1983, 8314584
Int. Cl.[4] G02B *7/04, 7/18, 21/26*
U.S. Cl. 350—520 7 Claims

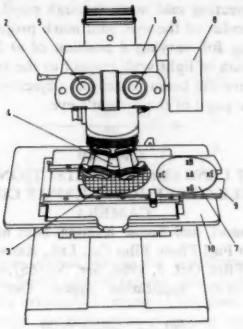
1. An optical microscope which comprises:

an adjustable mounting stage having first and second mounting locations which are spaced apart by a predetermined distance and which serve to mount respectively a first specimen and a second replica or reference specimen, the second specimen bearing at least one predetermined reference point, line, grid, area or the like;

a viewing head having a high magnification viewing system positioned to view the first mounting location and a low magnification system positioned to view the second mounting location;

an eyepiece on the viewing head;

and optical means provided on the viewing head and adjustable between a first position in which the eyepiece can be used to view the first mounting location via the high



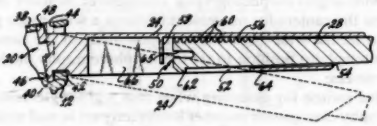
magnification viewing system and a second position in which the eyepiece can be used to view the second mounting location via the low magnification viewing system.

4,544,245

ADJUSTABLE SAFETY SPECTACLE

Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to McKesson Corporation, San Francisco, Calif.

Filed Jul. 16, 1979, Ser. No. 58,020
Int. Cl.⁴ G02C *5/20, 5/14*
U.S. Cl. 351—120 **13 Claims**



1. An adjustable safety spectacle including

a frame member including a nose bridge and lens supporting sections extending from the nose bridge and with the lens supporting sections including outwardly extending arm portions forming recesses at opposite ends of the frame member,

a pair of temple members each having an inner end portion received within a recess,

individual means coupled to the outwardly extending arm portions of the frame member and the inner end portions of the temple members for individually pivotably mounting the temple members to extend from the outwardly extending arm portions, and

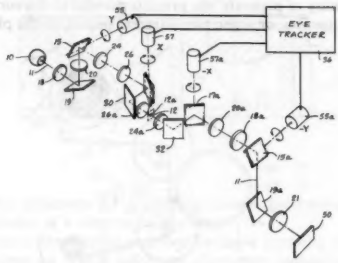
each means including a pair of pin members extending from opposite sides of the inner end portion of each temple member and a pair of openings on opposite sides of each recess formed by the oppositely extending arm portion for receiving the pin members and with one opening having a configuration for receiving one pin member for only pivotable movement and with the other opening having an elongated configuration having a plurality of stop positions for receiving the other pin member for sliding movement along the elongated opening to any one of the stop positions in accordance with pivotable movement of the one pin member in the one opening for producing a pivoting of the individual temple members, within the recess formed by the outwardly extending arm portion.

4,544,246

SYSTEM FOR PRODUCING SELECTIVE STABILIZATION OF A PORTION OF THE RETINAL IMAGE

Hewitt D. Crane, Portola Valley, and Donald H. Kelly, Los Altos Hills, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jun. 13, 1983, Ser. No. 503,800
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—211 **11 Claims**



1. A system capable of producing a stabilized obscuration on a retina which comprises: means for projecting the image of a visual scene along a first portion of an optical path, including first and second mirrors positioned serially along the optical path, each of said mirrors being mounted for rotation about an axis corresponding respectively to horizontal and vertical eye movements, optical means for forming an image of the eye at each of the first and second mirrors, with the center of rotation of the eye in each image nominally at the axes of rotation of the said first and second mirrors, first and second control means to respectively rotate the said first and second mirrors about their axes in response to movement of the eye, means for projecting at least a portion of the scene image along a second portion of said optical path to the eye of a subject, including means capable of negating the compensating effect for eye movement in said first portion of said optical path and a member of preselected shape and size positioned between said first portion of said optical path and said second portion of said optical path to form an obscuration on the retina which is stabilized with respect to eye movement.

4,544,247

STEREOSCOPIC PROJECTING APPARATUS

Yoshio Ohno, Oosaka; Katsuhiko Koyama, and Kohsaku Nishio, both of Ootawara, all of Japan, assignors to Photron Ltd., Oosaka and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Dec. 21, 1983, Ser. No. 563,987
Claims priority, application Japan, Dec. 24, 1982, 57-233175
Int. Cl.⁴ G03B *35/02, 41/06*
U.S. Cl. 352—62 **9 Claims**

1. A stereoscopic projecting apparatus which projects a stereoscopic image via a cinefilm on which left-eye pictures and right-eye pictures are alternately formed on consecutive frames, which apparatus comprises:

a light source for projecting a beam of light toward a predetermined region;

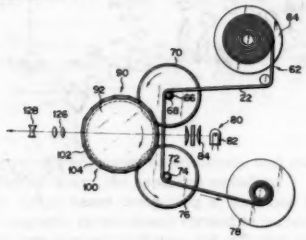
drive means for driving a cinefilm in such a manner that the cinefilm passes through the predetermined region toward which the light from the light source is projected;

a prism arranged in the region through which an image transmitted from the cinefilm is passed, the prism having a plurality of planes, through which the image becomes incident or from which the image emerges, and which planes are endlessly connected;

prism rotating means for rotating the prism about a rotating axis of the prism which includes the center of the plurality of planes and which is parallel to the plurality of planes;

synchronizing means for synchronizing the movement of the cinefilm and the rotation of the prism, so that each of the planes of the prism becomes parallel to the surface of the cinefilm when each one of the frames of the cinefilm is located at the center of the predetermined region toward which the light is being projected, thereby projecting a moving image;

detecting means for detecting the rotating position of the prism and producing a detection signal when one of the plurality of planes of the prism is parallel to the surface of the cinefilm, or when two adjacent planes, of the plurality



of planes of the prism, are inclined at the same angle with respect to the surface of the cinefilm, in the predetermined region;

a rotation control device for stopping the rotation of the prism upon reception of the detection signal from the detecting means, thereby two dimensionally or stereoscopically projecting a still image; and

deflecting means for deflecting the images, which deflecting means deflects the left-eye image transmitted from the frame on which the left-eye picture is formed in a first direction, and deflects the right-eye image transmitted from the frame on which the right-eye picture is formed in a second direction, the first and second directions being perpendicular to each other.

4,544,248

OPHATHALMOSCOPIC CAMERA HAVING A FOCUS DETECTING SYSTEM

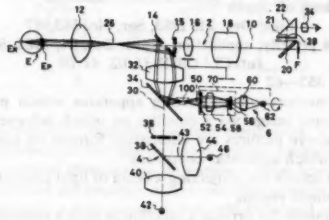
Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 582,062

Claims priority, application Japan, Feb. 18, 1983, 58-25949

Int. Cl.[4] G03B *29/00*; A61B *3/14*

U.S. Cl. 354—62 **9 Claims**



1. An ophthalmoscopic camera comprising a photographing optical system including objective lens means adapted to be positioned opposite to a patient's eye with a working distance and an image plane on which an image of fundus of the patient's eye is formed, an illuminating optical system for projecting a beam of illuminating light to the patient's eye, a focus detecting optical system including mark projecting means having a mark plate formed with at least one mark and located conjugate with said image plane of the photographing optical system with respect to said objective lens means and means for optically projecting said mark through pupil of the patient's eye to the fundus of the eye, said mark projecting means including means for varying a position of at least one mark-projecting beam of light with respect to the axis of the objective lens where the beam passes the objective lens, and with respect to the pupil of the patient's eye.

4,544,249

INCORRECT LENS SETTING DETECTION DEVICE FOR WIDE-ANGLE/TELEPHOTOGRAPHY CONVERTIBLE CAMERA

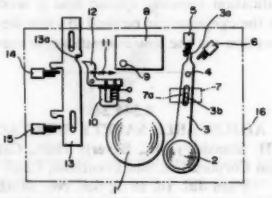
Takashi Maemori, and Kazuo Kamata, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1984, Ser. No. 657,406

Claims priority, application Japan, Oct. 3, 1983, 58-152040[U]

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—195.12 **9 Claims**



1. A camera selectively performing either wide-angle photography or telephotography, comprising:

a wide-angle/telephotography changeover member mounted on the camera for movement between a wide-angle position to set the wide-angle photography mode of the camera and a telephoto position to set the telephotography mode of the camera;

a first switch for detecting when said wide-angle/telephotography changeover member is correctly set in said wide-angle position;

a second switch for detecting when said wide-angle/telephotography changeover member is correctly set in said telephoto position; and

detecting means for detecting whether said wide-angle/telephotography changeover member is correctly set either in said wide-angle position or in said telephoto position, depending on the ON/OFF state of said first and second switches, said detecting means generating an incorrect lens setting signal when said wide-angle/telephotography changeover member is not correctly set.

4,544,250

OPTICAL SYSTEM FOR CAMERA WITH A VIEWFINDER

Kazuo Tanaka, Tokyo, and Sadahiko Tsuji, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,590

Int. Cl.[4] G03B *13/08, 13/12*

U.S. Cl. 354—199 **6 Claims**

1. An optical system for a camera comprising:

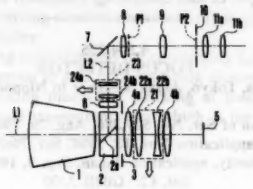
(a) a photographic optical system;

(b) a finder optical system;

(c) a beam splitter for dividing the light from said photographic optical system into two parts one of which goes to an image pickup plane of the camera and the other of which is directed to said finder optical system;

(d) an image magnification changing optical system for changing the value of the focal length of said photo-

graphic optical system to another, said image magnification changing optical system being arranged to move into or retract from, an optical path between said beam splitter and the image pickup plane of the camera; and



(e) a correction optical system for correcting the field of view of said finder optical system, said correction optical system being arranged to move in response to movement of said image magnification changing optical system, while changing the size of an image of said finder optical system.

4,544,251

COMPACT CAMERA

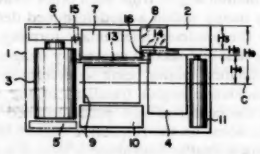
Keisuke Haraguchi, and Toru Kando, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,667

Claims priority, application Japan, May 8, 1982, 57-66115[U]

Int. Cl.⁴ G03B *17/02*

U.S. Cl. 354—288 **4 Claims**



1. A compact camera including a housing carrying an image transmitting aperture having a light-axis center, said camera comprising:

an auto focus mechanism positioned above the aperture;

a film cartridge chamber and a film spool chamber disposed on opposite sides of the aperture;

a strobe mechanism mounted above the film spool chamber, said auto focus mechanism positioned between the film cartridge chamber and the spool chamber, and having an upper surface at substantially the same height above the light axis center as an upper surface of the strobe mechanism;

film winding and shutter charge gear means mounted above the film cartridge, and a film winding gear means mounted between the film spool chamber and the strobe mechanism; and

transmission means extending between and interconnecting each of said gear means and positioned between the aperture and the auto focus mechanism for interlocking the rotation of said respective gear means, said transmission means comprising a first transmission gear meshing with and extending downwardly from the film winding and shutter charge gear means toward the light-axis center, a second transmission gear meshing with and extending downwardly from the film winding gear means toward the light-axis center, and interconnecting means for interconnecting the first and second transmission gears.

4,544,252

APPARATUS FOR DISPLAYING INFORMATION IN CAMERA VIEW FINDER

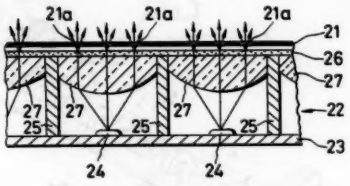
Masaaki Tsukamoto, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,247

Claims priority, application Japan, Mar. 8, 1983, 58-33404[U]

Int. Cl.⁴ G03B *17/20*; G01D *11/28*

U.S. Cl. 354—289.1 **5 Claims**



1. An apparatus for displaying camera information in the view finder of a camera, comprising:

(a) a sheet-like display member having a plurality of display portions on which reference characters indicative of said camera information are depicted, respectively;

(b) a light emission array including a plurality of light emission elements each corresponding to a respective one of said display portions on said display member, said light emission array being disposed opposed to and spaced away from said display member;

(c) light blocking means dividing the space between said light emission array and said display member into a plurality of regions each of which contains one of said light emission elements and one of said display portions, said light blocking means preventing said one display portion in each of said regions from being directly illuminated by light from the light emission elements in the adjacent regions;

(d) light condensing means disposed within each of said regions for condensing the light from each of said light emission elements and projecting it toward the corresponding display portion in said display member;

(e) light diffusion means located between said light condensing means and said display member and disposed substantially parallel with said display member; and

(f) said light condensing means including a plurality of plano-convex lens elements, each having an incident convex surface convex toward and opposed to said light emission array and an exit flat surface opposed to said light diffusion means, the exit flat surfaces being arranged on a fixed plane which is substantially parallel to said display member.

4,544,253

CONVEYING SYSTEM FOR PASSING PHOTOGRAPHIC LAYER-BEARING CARRIERS OF STRIP OR SHEET FORM THROUGH THE PHOTO CHEMICAL BATHS OF A DEVELOPING APPARATUS

Hermann Kümmerl, Kasseler Strasse 17, D-8500 Nuremberg 20, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,663

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306139

Int. Cl.⁴ G03D *3/13*

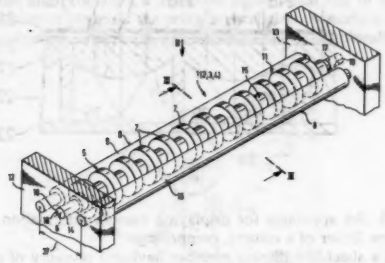
U.S. Cl. 354—321 **14 Claims**

1. A conveying system for passing a web- or sheet-shaped photographic la er-bearing carrier along a path through the photochemical baths of a developing apparatus, the carrier having an uncoated side, comprising:

at least one set of parallel conveying rollers, at least one roller of each set being driven, each set of rollers including a first roller having a first shaft and a peripheral surface, and

a second roller having a second shaft and a plurality of pressure elements rotatably mounted one behind the other on said second shaft, said elements being resiliently yielding in the radial direction with regard to said second shaft, each element having a first portion with a convex side, a concave side with a cavity therein that is open in the axial direction relative to said second shaft, and a periphery that is directed toward said peripheral surface of said first roller,

wherein said first and second rollers are disposed on either



side of said path and resiliently engage a carrier moving along said path, with the uncoated side of the carrier facing said second roller, to provide a carrier passage gap between said first and second rollers, the dimension of said gap along a line perpendicular to said first and second shafts being changeable to accommodate carriers having different thicknesses, and

wherein each of said pressure elements is of mushroom-shaped configuration and further comprises a second portion configured as central bush adapted for being mounted on said second shaft.

4,544,254

CAMERA WITH A DISPLAY DEVICE FOR DISPLAYING BOTH OBJECT DISTANCE INFORMATIONS AND COUPLING RANGE INFORMATIONS

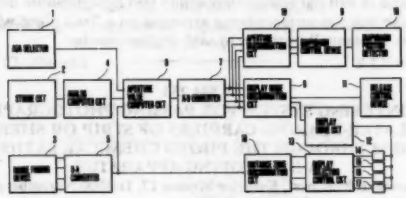
Akira Egawa, and Ryuji Tokuda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,632

Claims priority, application Japan, Oct. 4, 1982, 57-174212

Int. Cl.⁴ G03B *3/10, 15/05, 17/38*

U.S. Cl. 354—403 **20 Claims**



1. A camera comprising:

a strobe device having a main capacitor and arranged for producing signals representing at least three stages of variation of a voltage level to which a main capacitor is charged;

film speed input means for setting the speed of a film used in said camera;

an auto-focus device for producing a distance signal representing how far away from said camera an object lies;

computing means for computing an exposure value from a signal from said film speed input means, a signal representing the voltage level to which the main capacitor of said strobe device is charged, and the signal from said auto-focus device and finding out whether or not the exposure value for the object is proper for flash photography; and

display means for displaying the distance signal of said auto-focus device upon detection of a proper exposure value by the output of said computing means.

4,544,255

FOCUS DETECTOR

Ken Utagawa, Tokyo, Japan, assignor to Nippon Kogaku K. K., Japan

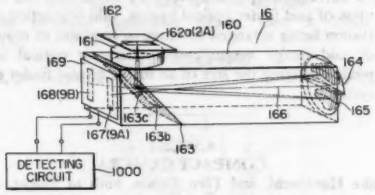
Continuation of Ser. No. 527,386, Aug. 29, 1983, abandoned.

This application Nov. 13, 1984, Ser. No. 671,064

Claims priority, application Japan, Sep. 3, 1982, 57-153632

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—406 **24 Claims**



1. A focus detector for detecting whether or not an image-forming optical system is forming a primary image of an object on or near a predetermined image-forming plane, said focus detector comprising:

(1) first and second concave mirrors disposed behind said predetermined image-forming plane and inclined at different inclination angles from each other so as to refocus the primary image within a predetermined detection area on or near the predetermined image-forming plane thereby forming first and second secondary images respectively,

said inclination angles being so determined that each of the incidence angles (randian) of the beams coming from the center of said predetermined detection area and incident on the respective centers of said concave mirrors is smaller than about $\sqrt{0.04/R}$ wherein R is the maximum diameter in mm of said concave mirrors; and

(2) photo-electric detection means for detecting the relative positional relationship between said first and second secondary images and forming a focus detection signal from the result of the detection.

4,544,256

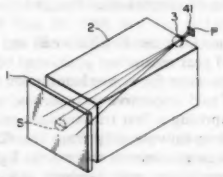
SINGLE LENS REFLEX CAMERA WITH LIGHT MEASURING DEVICE

Kikuo Momiyama, and Kazuo Fujibayashi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,704

Int. Cl.⁴ G03B *7/099*

U.S. Cl. 354—429 **9 Claims**



1. A single lens reflex camera comprising:

(a) a photographic system including a photographic lens;

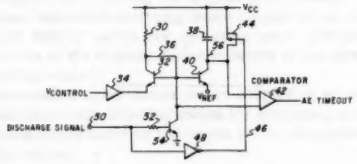
(b) a viewfinder optically disposed of said photographic system and including a focusing screen having a transparent area surrounded by a light diffusing area, a prism for changing the direction of an optical path, and a lens for observation from the object side;
(c) a light receiving element positioned off an optical axis of said viewfinder;
(d) converging optical means for converging light from said focusing screen to said light receiving element; and
(e) light blocking means for blocking at least part of an image of said transparent area which is formed by said converging optical means.

4,544,257

AUTOMATIC EXPOSURE CONTROL FOR A CAMERA SHUTTER

Hideo Taka, Tokyo, Japan, and Bernhard H. Andresen, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 6, 1984, Ser. No. 597,768
Int. Cl.⁴ G03B *7/083*
U.S. Cl. 354—460 **3 Claims**



1. An automatic shutter timing control for a camera comprising:
a capacitor which is charged by a current corresponding to the intensity of the received light;
a MOS FET transistor connected in parallel to said capacitor; and
means for reducing the current for charging said capacitor to a degree which is substantially negligible when said MOS FET transistor is conductive, said means having a switching element for making the charging current negligible.

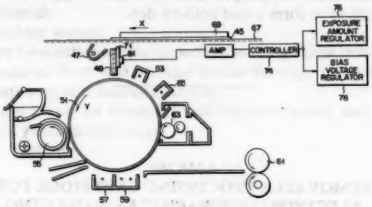
4,544,258

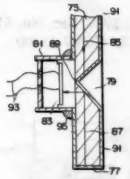
IMAGE DENSITY DETECTING UNIT FOR IMAGE FORMATION APPARATUS

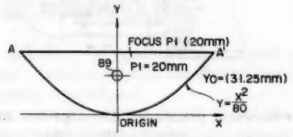
Shouji Takano, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1982, Ser. No. 435,605
Claims priority, application Japan, Oct. 23, 1981, 56-157008[U]; Jun. 7, 1982, 57-97304
Int. Cl.⁴ G03G *27/00, 27/34, 27/74, 15/00*
U.S. Cl. 355—1 **25 Claims**

25. An apparatus for focusing light comprising:
light transmissive solid body means for receiving light, said body means including means for defining a planar surface and means for defining a quadric surface, light incident upon said planar surface being transmitted through said body means toward said quadric surface;
first reflecting means, disposed on said quadric surface, for focusing said light incident on said quadric surface toward a focal point within said body means; and







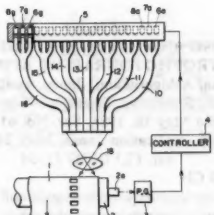
light detecting means, at least partially embedded within said body means at said focal point, for detecting the intensity of light focused toward said point.

4,544,259

SIDE PRINTING APPARATUS

Takeshi Kanaoka, and Shigehisa Shimizu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1984, Ser. No. 630,278
Claims priority, application Japan, Jul. 13, 1983, 58-126117
Int. Cl.⁴ G03B *27/00*
U.S. Cl. 355—1 **11 Claims**



1. In a side printing apparatus for printing a mark in a dot pattern as a latent image on a colored light sensitive material while said material is moving; the improvement comprising:
a plurality of picture element display sections each for producing a colored dot from a plurality of which colored dots said mark is composed;

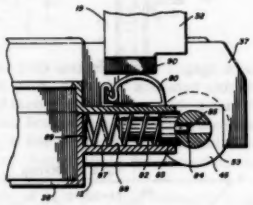
each of said sections comprising a plurality of simultaneously actuated sources of lights of different colors, and a plurality of light guides for mixing said lights of different colors to form a said colored dot.

4,544,260

REMOVABLE PROCESSING CARTRIDGE FOR ELECTROSTATOGRAPHIC REPRODUCING APPARATUS

James R. Kolbe, Sodus, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1984, Ser. No. 614,203
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 BE **18 Claims**



1. A removable processing cartridge for an electrostatographic reproducing apparatus comprising a cartridge frame assembly containing at least one electrostatographic processing unit, means to mount said cartridge about end thereof to a receiving mount in said reproducing apparatus and positioning means near the opposite end of said cartridge, said positioning means comprising elastomeric loops adapted to engage a frame member of said reproducing apparatus in a compression spring action to thereby maintain the cartridge in its operational position, said loops being of sufficient size and shape that they may be used as handles to manually extract the cartridge from said reproducing apparatus.

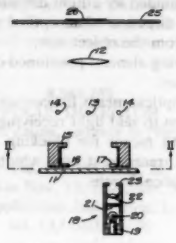
4,544,261

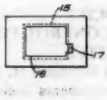
CHARGING AND EXPOSURE SECTION IN AN ELECTROPHOTOGRAPHIC APPARATUS

Shuichi Ohtsuka, Ashigarakami, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 18, 1984, Ser. No. 611,882
Claims priority, application Japan, May 24, 1983, 90102
Int. Cl.⁴ G03G *15/04*
U.S. Cl. 355—3 CH **3 Claims**

1. A charging and exposure section of an electrophotographic apparatus comprising an objective lens focusing the image of a picture carried by an original placed on a supporting table onto an electrophotosensitive member, a charging means disposed between said objective lens and said electrophotosensitive member for charging said electrophotosensitive member, an exposure mask disposed between said charging means and said electrophotosensitive member for defining an exposure area of said electrophotosensitive member, and a charging mask disposed between said exposure mask and said electrophotosensitive member for defining a charge area of said electrophotosensitive member, said charging mask having a cut-





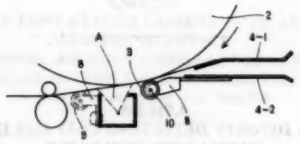
out portion extending outward beyond a marginal edge of said exposure mask.

4,544,262

TRANSFER STATION ALIGNMENT DEVICE

Shinji Kanemitsu, Ichikawa, and Yoshikuni Tohyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1983, Ser. No. 512,708
Claims priority, application Japan, Jul. 19, 1982, 57-125515
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 TR **7 Claims**



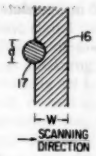
1. A transfer station alignment device comprising:
an image bearing member for bearing an image to be transferred;
means for transferring the image on said image bearing member onto a transfer material in the form of a sheet;
means for separating said transfer material from said image bearing member at a marginal region; and
a rotary member located upstream of said transferring means with respect to the direction of movement of said transfer material to make a rolling contact with said image bearing member and to grip the transfer material between itself and said image bearing member.

4,544,263

COPYING MACHINE HAVING AN IMAGE DENSITY CONTROL DEVICE

Koji Sasaki, 2-36-14, Hinodai, Hino-shi, Tokyo; Eiichi Yoshida, 2-5-19 Owada-cho, Hachioji-shi, Tokyo, and Akira Sawaki, 987, Higashiasakawa-machi, Hachioji-shi, all of Japan

Filed Nov. 7, 1983, Ser. No. 549,587
Claims priority, application Japan, Nov. 25, 1982, 57-206314
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 E **3 Claims**



1. In an electrophotographic copying machine having an image density control device in which copy density is controlled by detecting an original density, said image density control device comprising:

density detecting means including means for scanning a light beam having a certain scanning spot size over a printed original, for detecting the original print density,

original line-width detecting means coupled to an output of said density means for detecting print character line widths of the original from the output of the density detecting means,

compensation signal output means coupled to an output of said line-width detecting means for generating a compensation signal based on the output of the line-width detecting means,

compensating means coupled to said density detecting means and said compensation signal output means for compensating the output of the density detecting means according to the output of the compensation signal output means and for outputting a corresponding compensated detected density signal, and

copy-process controlling means coupled to said compensating means for controlling copy-image density according to the output of the compensating means.

4,544,264

FINE LINE PRINT ENHANCEMENT

Larry W. Bassetti, and Sherwood Kantor, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1984, Ser. No. 611,443
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 R **36 Claims**

1. An electrophotographic printing machine comprising:

drive means;

movable carrier means driven by said drive means;

photoreceptive material mounted on said movable carrier means for cyclic movement through electrophotographic process stations;

charge corona means located at a first station for placing a relatively uniform electrostatic charge on the surface of said photoreceptive material;

exposure means located at a second station for selectively discharging the charged photoreceptive material to cause the formation of a latent image on said material;

toner for developing said image;

developer means located at a third station for applying said toner to said image to produce a developed image;

image receiving material;

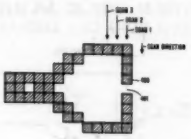
transfer means located at a fourth station for transferring said developed image from said photoreceptive material to said image receiving material;

paper storage means for holding a supply of image receiving material;

a finishing station;

paper forwarding means for serially moving image receiving material from said storage means through the transfer station to said finishing station;

control means for operating said exposure means, said control means comprising:



a character generator for producing data signals to drive said exposure means to produce the desired image on said photoreceptive material; and

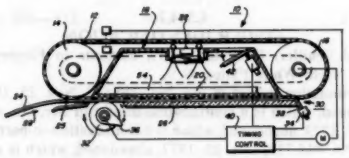
enhancement means for altering certain of said data signals before presentation of said signals to said exposure means to produce broadened image lines on said photoreceptor where said lines occur in either of two dimensions perpendicular to each other.

4,544,265

GROOVED VACUUM BELT DOCUMENT HANDLING SYSTEM

Edward A. Powers, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1983, Ser. No. 534,446
Int. Cl.⁴ G03B *27/62*
U.S. Cl. 355—76 **9 Claims**



1. A document handling system of the type in which a document is transported to an imaging station of an electrophotographic printing machine comprising:

at least one document transport belt having a plurality of apertures therethrough, said belt having a reflective surface except for areas surrounding said apertures, said areas being at least partially transmissive to light, and

vacuum means in communication with said belt for retaining the document therein, said means having reflective areas in optical communication with said belt aperture areas.

4,544,266

APPARATUS AND A METHOD FOR TESTING THE AUTHENTICITY OF DOCUMENTS

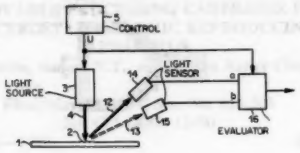
Gregor Antes, Zürich, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Sep. 28, 1982, Ser. No. 425,455

Claims priority, application Switzerland, Oct. 27, 1981, 6836/81

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 356—71 **17 Claims**



1. In an apparatus for examining the authenticity of a document, including at least a machine-readable authenticity feature in the form of an optical microstructure for diffracting at least one component of a beam of light rays having a central axis, an intensity distribution and a wavelength of a first predetermined value and impinging on said microstructure along a predetermined direction, a light source for emitting said beam of light rays, the components of the light rays diffracted from said microstructure having an intensity distribution defining an effective center of intensity distribution along one direction of diffraction, light-sensing means for sensing the light rays diffracted by said microstructure and generating electrical signals from the sensed light rays, and evaluating means for processing the electrical signals generated by said light sensing means, and for providing from information contained in the processed electrical signals a YES/NO decision whether the document is authentic or not,

in combination,

control means connected to said light source for the control thereof so that said light source switches the wavelength of said beam of light rays from said first predetermined value to a second predetermined value, and being free from disturbing the central axis and the intensity distribution of said beam,

said evaluating means providing said YES decision if the effective center of the intensity distribution of the components of the light rays diffracted by said microstructure at said first predetermined wavelength value lies along a first prearranged direction, and that of the components of the light rays at said second predetermined wavelength value lies along a second predetermined direction.

4,544,267

FINGER IDENTIFICATION

Michael Schiller, Riverside, N.Y., assignor to Fingermatrix, Inc., North White Plains, N.Y.

Continuation-in-part of Ser. No. 210,174, Nov. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 42,605, May 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 844,719, Oct. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 891,497, Mar. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 844,580, Oct. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 396,813, Jul. 9, 1982, abandoned. This application Mar. 7, 1983, Ser. No. 472,640

Int. Cl.⁴ G06K *9/20*

U.S. Cl. 356—71 **13 Claims**

1. Fingerprint processing apparatus comprising:

a source of an interrogating light beam,

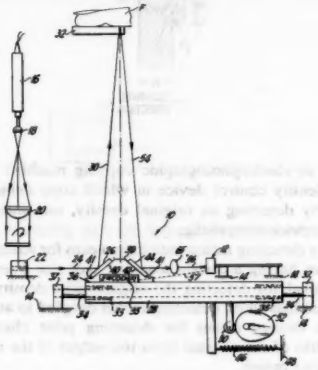
means to provide a fingerprint object having ridge zones and valley zones in the path of said interrogating light beam, said object modulating said interrogating light beam to provide a reflected light beam modulated with fingerprint information,

linear displacement optical scanning means for causing said interrogating light beam to scan the fingerprint object and for maintaining the angular relationship between said interrogating beam and the fingerprint object being scanned constant throughout the optical scan,

an array of photoelectric transducers optically downstream from said platen, and

lens means positioned in said reflected light beam to provide a fingerprint image at said array,

said array being arranged in a predetermined linear form for



receiving said modulated light beam and for converting the fingerprint information carried by said modulated light beam into a plurality of sets of information signals representing a line by line scan of the fingerprint object, and

electrical scanning means to electronically scan the information signal outputs of said array and to synchronize said electric scan to incremental positions of said linear displacement scanning means to provide a relatively faster electronic scan along said array and a relatively slower optical scan along an axis transverse to said array, said slower optical scan being effected by the linear displacement between the light beam and the fingerprint object.

4,544,268

METHOD AND APPARATUS FOR DETECTING FLAW ON THREADS OF MALE SCREW

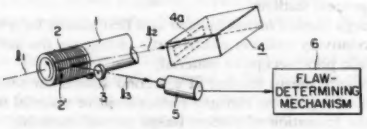
Takeo Yamada; Mitsuaki Uesugi, both of Yokohama, and Masaru Okamura, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 567,949

Claims priority, application Japan, Jan. 31, 1983, 58-12952

Int. Cl.⁴ G01B *11/24, 11/30*

U.S. Cl. 356—394 **4 Claims**



3. An apparatus for detecting a flaw on threads of a male screw, which comprises:

a male screw rotating means for rotating a male screw at a prescribed circumferential speed around the axis thereof;

a light source for uniformly applying a light onto substantially the entire surface of threads of said male screw in the axial direction thereof and at least part of the surface of said threads of said male screw in the circumferential direction thereof;

a photoelectric converter for continuously measuring, during one turn of said male screw around the axis thereof, electric signal values corresponding to variations in brightness of the surface of said male screw in the axial direction thereof, which are caused by tops, roots and flanks of said threads of said male screw onto which said light is applied; and

a flaw-determining mechanism for comparing an average value of said electric signal values corresponding to said variations in brightness of said male screw in the axial direction thereof, as measured by said photoelectric converter, with a previously set reference values, to detect a flaw on said threads of said male screw, said flaw-determining mechanism comprising a memory for continuously storing, during said one turn of said male screw, said electric signal values corresponding to said variations in brightness of said male screw in the axial direction thereof, as measured by said photoelectric converter; and a flaw-detecting means for obtaining said average value of said electric signal values corresponding to said variations in brightness of said male screw in the axial direction thereof, as continuously stored in said memory during said one turn of said male screw, and for comparing the thus obtained average value of said electric signal values, with said previously set reference value, to detect a flaw on said threads of said male screw;

characterized in that:

said light source (4) is provided at a position from which said light is fully applied onto the tops, the roots and the flanks of said threads (2) of said male screw (1);

said memory (11) of said flaw-determining mechanism (6) includes a means for continuously determining, during said one turn of said male screw (1), electric signal values corresponding to variations in brightness of said male screw (1) in the circumferential direction thereof, on the basis of said electric signal values corresponding to said variations in brightness of said male screw (1) in the axial direction thereof; and

said flaw-detecting means of said flaw-determining mechanism (6) comprises:

a first moving average calculating circuit (10) for moving-averaging, during said one turn of said male screw (1), said electric signal values corresponding to said variations in brightness of said male screw (1) in the axial direction thereof, as measured by said photoelectric converter (5), the thus moving-averaged electric signal values being entered into said memory (11);

a second moving average calculating circuit (12) for moving-averaging, during said one turn of said male screw (1), said electric signal values corresponding to said variations in brightness of said male screw (1) in the circumferential direction thereof, as determined by said memory (11);

a difference calculating circuit (13) for calculating, during said one turn of said male screw (1), values of differences between said electric signal values corresponding to said variations in brightness of said male screw (1) in the circumferential direction thereof, as moving-averaged by said second moving average calculating circuit (12), on one hand, and said electric signal values before said moving-averaging corresponding to said variations in brightness of said male screw (1) in the circumferential direction thereof, as determined by said memory (11), on the other hand;

a mean square calculating circuit (14) for obtaining a mean square value of said electric signal values as said average value of said electric signal values, from said values of differences as calculated by said difference calculating circuit (13); and

a comparing circuit (15) for comparing said mean square value of said electric signal values obtained by said mean square calculating circuit (14) with said previously set reference value.

4,544,269

DEVICE FOR MEASURING LIGHT INCIDENT ON AN OPTICAL SYSTEM

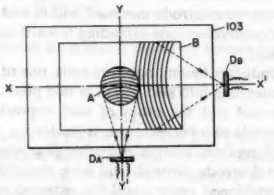
Noriyuki Nose, and Kiyonobu Endo, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 284,114

Claims priority, application Japan, Jul. 25, 1980, 55-101910; Jul. 25, 1980, 55-101911; Jul. 25, 1980, 55-101912

Int. Cl.⁴ G01J *1/42;* G02B *5/18*

U.S. Cl. 356—222 **9 Claims**



1. A device for measuring light incident on an image forming optical system, comprising:

an image forming optical system defining an optical path;

a beam splitter disposed in said optical path and having a plurality of diffraction lattices of different predetermined areas, each of said diffraction lattices providing, when even input light is incident on each of said diffraction lattices, substantially the same total quantity of diffracted light irrespective of the difference in the areas of the diffraction lattices; and

light measuring means having photodetector means for receiving the diffracted light from said diffraction lattices.

4,544,270

APPARATUS FOR THE SPECTROGRAPHIC ANALYSIS OF WORKPIECES FORMED FROM IRON AND STEEL ALLOYS

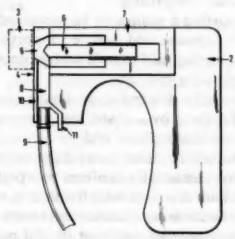
Wilhelm Berstermann; Ulrich Grisar, both of Georgsmarienhütte, and Egon Koerfer, Osnabrück, all of Fed. Rep. of Germany, assignors to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Apr. 7, 1983, Ser. No. 482,985

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213660

Int. Cl.⁴ G01N *21/67*

U.S. Cl. 356—313 **2 Claims**



1. A portable test head which is attachable to a portable spectrometer and which can be positioned against a workpiece containing iron and steel alloys in order to accomplish a spec-

trographic analysis of the carbon line 1931.02, said test head comprising

a housing, said housing having a front side intended to face a workpiece to be analyzed and an inlet connection which communicates with said front side;

a plate positioned on said front side of said housing, said plate having

a flat external surface which is abuttable against a workpiece to be analyzed and a peripheral edge,

a bore extending therethrough from said flat external surface toward said front side of said housing, and

an elongated recess which extends therethrough in parallel with said flat external surface from said bore therein to its peripheral edge, said recess communicating with said inlet connection in said housing;

a single counterelectrode mounted within said housing, said single counterelectrode extending toward said bore in said plate; and

a light conductor having opposite ends, one of said opposite ends extending into said recess in said plate at the periphery thereof and the other of said opposite ends being connectable to a portable spectrometer;

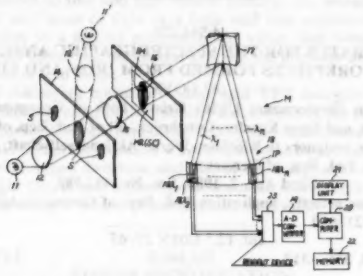
light resulting from a unipolar discharging passing from said counterelectrode through said bore and striking a workpiece positioned against said flat external surface of said plate passing through said recess in said plate which contains argon gas supplied through said inlet connection in said housing and into said light conductor, said light conductor being shielded by said plate from a direct viewing of said workpiece.

4,544,271

DENSITOMETER

Hiroshi Yamamoto, Nagaokakyo, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Nov. 26, 1982, Ser. No. 444,703
Claims priority, application Japan, Nov. 28, 1981, 56-191599
Int. Cl.⁴ G01J *3/18, 3/42*
U.S. Cl. 356—328 **5 Claims**



1. A densitometer comprising:

means for supporting a sample to be measured;

an entrance slit adjacent said sample supporting means;

means for illuminating said sample and projecting an image of said sample onto said slit;

means for spectrally dispersing an image section, passing through and defined by said slit, into corresponding spectral lines on an image plane; and

at least one photodiode linear array disposed on said image plane so as to substantially conform to a particular one of said spectral lines at a particular frequency, such that each diode of said linear array receives and senses an amount of light of a corresponding segment of said particular spectral line and outputs a signal level accordingly to a computer for processing said signal levels;

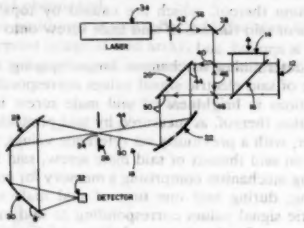
whereby a density measurement of said image section; at at least one frequency, is provided.

4,544,272

ALIGNMENT APPARATUS AND METHOD FOR INTERFEROMETER SPECTROMETERS

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,013
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—346 **20 Claims**



1. For use in an interferometer spectrometer having an analytical beam which is divided by a beamsplitter into a variable-length scanning arm and a fixed-length arm, each arm being defined by a reflector, and a laser beam which traverses the interferometer arms to provide clock signals to the spectrometer during scanning, that method of aligning the spectrometer optical elements, in order to provide optimal interferometric accuracy, which comprises:

directing the clock-signal-providing laser beam through the interferometer for alignment purposes;

adjusting the interferometer during alignment so that the reflector which defines the first interferometer arm returns the laser beam co-linear or parallel to the entering laser beam; and

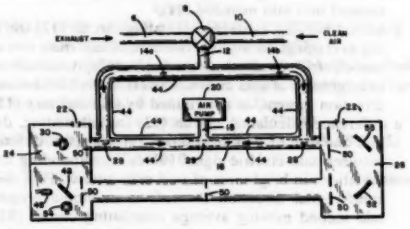
separately adjusting the interferometer during alignment so that the reflector which defines the second interferometer arm returns the laser beam co-linear or parallel to the entering laser beam.

4,544,273

SMOKE OPACITY METER

Dale F. Berndt, Plymouth, Minn., assignor to Particulate Instruments, Plymouth, Minn.

Filed Jul. 29, 1983, Ser. No. 518,633
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 356—434 **12 Claims**



1. Apparatus for measuring the particulate content of air comprising:

an elongated hollow chamber having at least one end mounted input port and at least one output port mounted along the length of said chamber;

means for coupling sample quantities of particulate containing air to said input port;

light source means for directing a beam of light from one end through said chamber and the air therein;

light detector means mounted along said chamber beyond

said outlet port in opposed relation to said light source means for detecting emanating light;

means for establishing a pressure differential from said input port to said output port and directing air flow towards said output port and away from said light source means and said light detector means; and

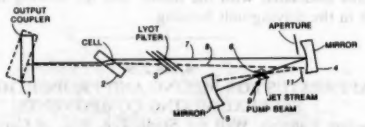
means responsive to detected light for measuring the particulate content of the sample air.

4,544,274

APPARATUS AND METHOD FOR MEASUREMENT OF WEAK OPTICAL ABSORPTIONS BY THERMALLY INDUCED LASER PULSING

David A. Cremers, and Richard A. Keller, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1982, Ser. No. 386,372
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 356—436 **15 Claims**



1. A method for measuring weak solute optical absorptivity, α_s, using the thermal lensing phenomenon, which comprises the steps of:

a. inserting a cell containing a solution of the solute in a chosen solvent, into the cavity of a normally continuous-wave output laser;

b. misaligning the output coupler of said laser cavity to induce pulsed laser operation consisting of a series of equally-spaced output pulses having identical first pulsewidth, which result from the thermal lensing phenomenon occurring within said cell because of the interaction of said solution with laser radiation circulating within said cavity;

c. measuring said first pulsewidth of said laser output pulse;

d. establishing a calibration curve of a series of second pulsewidth measurements, Δt, versus solute absorptivity, α_s, for said chosen solvent and a solute of known absorptivity and having unit efficiency for the conversion of absorbed laser light into heat, placed in said cell in said laser cavity; and

e. comparing said first measured pulsewidth with said calibration curve to locate the corresponding absorptivity which is the desired solute optical absorptivity because for weakly absorbing solutions, total absorptivity depends substantially upon the solute absorptivity and the absorption of the solvent and not on the nature of the solute.

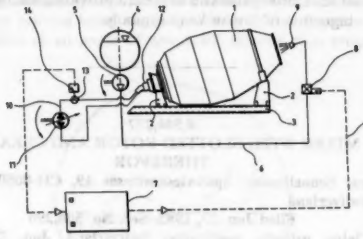
4,544,275

CONCRETE MIXER TRUCK

Gerhard Hudelmaier, Ulm, Fed. Rep. of Germany, assignor to Ingrid Hudelmaier, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,141
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310570
Int. Cl.⁴ B28C *7/12*
U.S. Cl. 366—30 **11 Claims**

1. A concrete mixer truck comprising: a mixer drum adapted to be rotatably driven by means of a hydraulic system; a water container; a water conduit leading from said container to said drum; a water pump; a measuring device for sensing the drive torque of said mixer drum, said measuring device comprising a pressure sensor for sensing the pressure prevailing in the hydraulic system for determining the drive torque; and a valve included in said water conduit an adapted to be controlled in response to said measuring defice so as to close said water conduit when said drive torque lies above a selectively adjust-



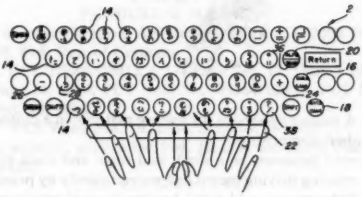
able rated value at least above the drive torque for the empty mixer drum.

4,544,276

METHOD AND APPARATUS FOR TYPING JAPANESE TEXT USING MULTIPLE SYSTEMS

Richard A. Horodeck, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 477,481, Mar. 21, 1983, abandoned. This application Oct. 6, 1983, Ser. No. 539,520
Int. Cl.⁴ B41J *5/30*
U.S. Cl. 400—110 **13 Claims**



1. Apparatus for typing Japanese text material which incorporates hiragana, katakana, kanji and English alphabet syllabaries, comprising:

a hiragana keyboard having plural keys selectively mapped in hiragana, katakana and English alphabet syllabaries, said keyboard producing kana identifier signals corresponding to selected keys in said hiragana or katakana mapping;

function shift means for selectively changing the mapping of said keyboard to shift between hiragana, katakana and English alphabet mapping;

at least three delimiter signal means on said keyboard producing delimiter signals for use in automatic solution of ambiguities;

selector keys on said keyboard for manual resolution of ambiguities;

memory means including selected kanji symbols and lists of selected kanji symbols retrievable by address signals;

microprocesor means connected to said keyboard and to said memory means and responsive to specified sequences of kana identifier signals and delimiter signals from said keyboard to produce address signals, said address signals calling up from said memory means corresponding kanji symbols or lists of symbols, said microprocessor means being further responsive to specified kana identifier signals alone to produce corresponding kana outputs; and

display means responsive to said kana outputs to produce a text display of the kana corresponding thereto, and being further responsive to said microprocessor to display said kanji symbols or lists of symbols called up from said mem-

ory means, said delimiter signals providing automatic disambiguation of lists of kanji symbols corresponding to said input kana identifier signals from said keyboard and said selector keys on said keyboard providing manual disambiguation of lists of kanji symbols.

4,544,277

MIXER WITH SLOTTED ROTOR AND CLEANER THEREFOR

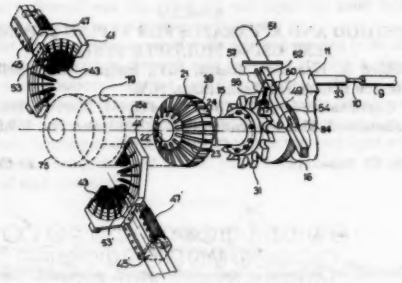
Oscar Schnellmann, Spielwiesenstrasse 19, CH-8050 Zurich, Switzerland

Filed Jun. 27, 1983, Ser. No. 508,295

Claims priority, application Switzerland, Jun. 25, 1982, 3916/82

Int. Cl.⁴ B28C *1/16*

U.S. Cl. 366—78 **25 Claims**



1. A mixing apparatus for mixing material in a closed mixing chamber, comprising:

a rotor mounted on a shaft, said rotor and shaft rotated by rotating driving means and moved axially by primary axial drive means, said rotor having internal passageways for passing the material being mixed therethrough;

cleaning means normally located outside the mixing chamber and having cleaning fingers corresponding to said rotor passageways; and

positioning means for aligning said rotor passageways with said cleaning fingers afer a mixing operation.

4,544,278

KITCHEN MACHINE

Marten F. Elkerbout, Groningen, and Leonardus P. A. Kloosterhof, Hoogeveen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

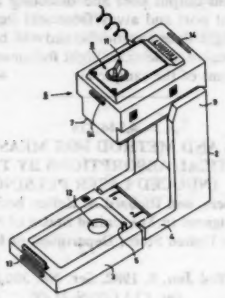
Filed Jan. 30, 1984, Ser. No. 575,258

Claims priority, application Netherlands, Feb. 7, 1983, 8300452

Int. Cl.⁴ A47J *43/08*

U.S. Cl. 366—129 **5 Claims**

1. A kitchen machine which comprises a U-shaped housing having a base and oppositely disposed, upwardly extending sides; a cover pivotally connected to one end edge of the base, said cover being rotatable to a position constituting an extension of said base to serve as a support for a bowl; a driving unit including a housing and a motor unit, said driving-unit housing being rotatably connected to the upper portion of each side of the U-shaped housing, said motor unit having its own housing; a detachable handle for the motor unit; first means associated with the detachable handle for attaching said handle to the motor unit to enable the motor unit to be arranged in the driving-unit housing and to be removed therefrom; and second



means associated with the motor unit for locking the motor unit in the driving-unit housing.

4,544,279

APPARATUS FOR MIXING AND PROPORTIONING SEVERAL MIXING COMPONENTS

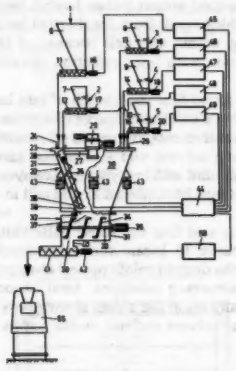
Joachim Rudolph, Weil der Stadt, Fed. Rep. of Germany, assignor to Werner and Pfleiderer, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 421,968, Sep. 23, 1982, Pat. No. 4,498,783. This application Sep. 21, 1984, Ser. No. 653,722

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146667

Int. Cl.⁴ B01F *15/02*

U.S. Cl. 366—132 **2 Claims**



1. Apparatus for mixing and proportioning a plurality of components said apparatus comprising

a mixer,

a plurality of proportioning feed means for the mixing components located upstream of the mixer,

said feed means being constructed as screw proportioning devices,

a continuously proportioning removal device with a driving motor for the mixture positioned downstream of the mixer,

said mixer and said removal device being supported on at least one weight transducer,

a speed' regulator for said driving motor of said removal device,

a regulating and control device,

said regulating and control device being operatively connected with said weight transducer, each of said feed means and said speed regulator of said driving motor of said removal device such that said regulating and control device controls said speed regulator according to signals of said weight transducer during a feed sequence pause of said feed means and switches the speed regulator to a constant speed corresponding to the average speed during said preceeding feed sequence pause during a feeding cycle.

4,544,280

GRAIN HANDLING SYSTEM

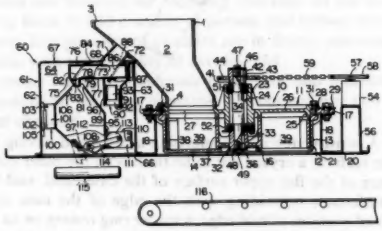
Zendo Mitsukawa, Higashihiroshima, Japan, assignor to Satake Engineering, Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 554,783

Claims priority, application Japan, Dec. 11, 1982, 57-216266; Jun. 16, 1983, 58-108928

Int. Cl.⁴ B01F *15/04*

U.S. Cl. 366—141 **31 Claims**



1. A grain handling system comprising:

at least one flow passage defining means for defining a grain flow passage having an upstream intake end and a downstream discharge end so as to allow the grain to flow along said grain flow passage from said upstream intake end to said downstream discharge end,

valve means disposed in communication with said downstream discharge and of said grain flow passage for controlling the flow rate of grain discharged from said downstream discharge end;

volumetric weight measuring means for receiving the grain to be delivered toward said valve means and for measuring weight per unit volume of the received grain under stationary condition to generate a volumetric weight signal;

computer means connected to said volumetric measuring means for receiving the volumetric weight signal therefrom to generate a control signal on the basis of said volumetric weight signal; and

drive means drivingly connected to said valve means and connected to said computer means, said valve means being operative in response to said control signal from said computer means to drive said valve means so as to allow the grain discharged by said valve means to be controlled in terms of weight unit.

4,544,281

MIXERS

Noel R. Wilkinson, Burton-on-Trent, England, assignor to Robert Morton DG Limited, England

Filed Jul. 16, 1984, Ser. No. 630,976

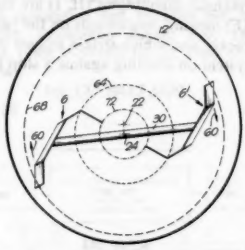
Claims priority, application United Kingdom, Jul. 21, 1983, 8319719

Int. Cl.⁴ B01F *7/20*

U.S. Cl. 366—325 **12 Claims**

1. A fluid mixer for a vessel, said mixer comprising

at least two interconnected blades rotatable within said vessel, each blade being mounted opposite the other relative to a rotation axis for said blades, each blade being formed from at least two connected substantially planar portions, the leading edge of the leading planar portion being radially spaced from said rotation axis, the leading planar portion being angled inwardly in the direction of rotation at an angle of about 30° relative to a tangent



drawn on a phantom circle of rotation that includes the leading edge of that leading planar portion, and the leading edge of each planar portion being positioned at a lesser radial distance relative to said rotation axis than the trailing edge of each said portion is positioned relative to said rotation axis.

4,544,282

PENDULUM MEANS

José H. Sánchez Giraldez, Am Rathenaupark 3, D-2000 Hamburg 50, Fed. Rep. of Germany

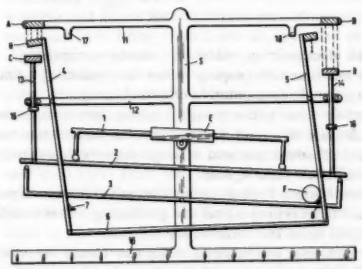
PCT No. PCT/DE84/00012, § 371 Date Sep. 14, 1984, § 102(e) Date Sep. 14, 1984, PCT Pub. No. WO84/02811, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 16, 1984, Ser. No. 650,607

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301222

Int. Cl.⁴ G04B *17/02*

U.S. Cl. 368—179 **3 Claims**



1. Pendulum means with a post on which more than one rocker is mounted, characterized in that on either side of its axis of symmetry, the symmetrical post (S) carries a fixed magnet (A, B), each of which is faced by a movable magnet (C, D) in such a way that the magnetic field distance between the two pairs of magnets (A, B; B, D) varies and can be reduced to a minimum amount; that the two movable magnets (C, D) are so coupled together by a rocker (2) and a linkage connected in articulated manner thereto that alternately in each case one movable magnet (C) assumes the minimum spacing and the other (D) the maximum spacing from the fixed magnet associated therewith; that a magnetic diaphragm (H, I) movable at right angles to the magnetic field in the area of the minimum spacing is associated with each pair of magnets (A, C; B, D);

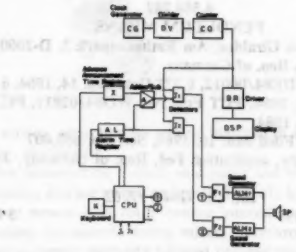
that the two magnetic diaphragms (H, I) are so coupled together by rockers (4, 5) mounted on the post and a control linkage (6), that alternately one diaphragm (H) passes in blocking manner into the magnetic field of one pair of magnets (A, C) and the other diaphragm (I) releases the magnetic field between the other pair of magnets (B, D) and that the rockers and linkage systems associated with the movable magnets (C, D) and the magnetic diaphragms (H, I) are coupled together by a weight (F) moving downwards on the particular sloping surface of a rocker and which strikes against the other rocker and linkage system on abutting against a stop (7 or 8).

4,544,283

ALARM TIMEPIECE WITH FACILITIES OF PROVIDING PRECAUSIONARY ALARM

Yasuhiro Nakanishi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1980, Ser. No. 171,804
Claims priority, application Japan, Jul. 25, 1979, 54-95194
Int. Cl.⁴ G04C *21/16*
U.S. Cl. 368—251 **5 Claims**



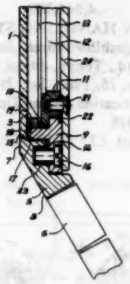
1. An electronic appointment calendar comprising:
time and date timekeeping means for producing a timekeeping signal representative of actual time;
schedule time and message register means for storing a schedule time and its associated alphanumeric message, said schedule time and message register means producing a schedule time signal;
detector means for comparing said schedule time signal with said timekeeping signal and producing a first coincidence signal upon the coincidence thereof;
advance time announcement register means for storing an advance notice elapsed time period and for producing an elapsed time period signal;
calculator means for calculating an advance advising time from said elapsed time period signal and said schedule time signal and producing a signal representative thereof;
said detector means further comparing said advance advising time signal with said timekeeping signal and producing a second coincidence signal upon the coincidence thereof;
means for displaying said schedule time and its associated message in response to the generation of at least one of said first and second coincidence signals by said detector means; and
alarm means for generating a first alarm in response to generation of said first coincidence signal and a second alarm in response to generation of said second coincidence signal.

4,544,284

LEAKPROOF WATCH CASE

Michel Geiger, La Neuveville; Gaston Gagnebin, Bienne, and Jacques Ackermann, La Chaux-de-Fonds, all of Switzerland, assignors to Omega SA, Bienne, Switzerland

Filed May 22, 1984, Ser. No. 612,828
Claims priority, application Switzerland, May 25, 1983, 2848/83
Int. Cl.⁴ G04B *37/00*
U.S. Cl. 368—294 **7 Claims**



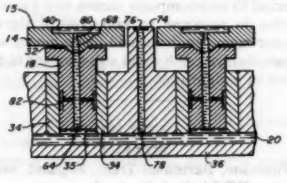
1. A wrist-watch case comprising a case-band having a flat upper surface, a crystal cut to lie flush with the outer circumference of the flat upper surface of the case-band, said outer circumference coinciding with the edge of the case at two opposed portions of said edge, a spacer ring resting on an inner ledge of the case-band to support the movement, and a screw-fastened back, characterized by the fact that said case includes a removable assembly which comprises two caps and the crystal, said crystal having two opposed beveled edges with each of said caps abutting a respective one of said beveled edges, each of said caps being positioned upon a second, outer ledge of the case-band and held in place with screws, said caps extending from the case-band to form end link to which a bracelet of articulated link may be attached.

4,544,285

FLUID EQUALIZED TILTING PAD THRUST BEARINGS

Wilbur Shapiro, Schenectady, N.Y.; Richard W. Graham, II, Clarksburg, and Hugh G. Anderson, Jr., Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1983, Ser. No. 486,170
Int. Cl.⁴ F16C *39/04, 17/06*
U.S. Cl. 384—99 **4 Claims**



1. A thrust bearing in the shape of a ring having a central aperture, comprising:
a plurality of thrust pads arranged around said ring, each of said thrust pads including a thrust receiving surface and having a recess in said thrust receiving surface;
hydraulic oil supplying means for providing hydraulic oil to said thrust bearing;

a first plurality of channels for carrying hydraulic oil, each of said channels being in fluidic communication with said hydraulic oil supplying means;

a second plurality of channels for carrying hydraulic oil, each of said channels being in fluidic communication with one of said recesses and passing through the corresponding thrust pad, each of said channels including an orifice restriction, said channels also being connected to said hydraulic oil supplying means via a corresponding channel of said first plurality of channels;

a plurality of pistons, each of said pistons supporting one of said thrust pads, each of said plurality of pistons having one of said first plurality of channels passing therethrough;

at least one manifold connected to said hydraulic oil supplying means;

a plurality of bushings for housing said plurality of pistons, each of said bushings in combination with one of said plurality of pistons defining a cavity, wherein said plurality of cavities are in fluidic communication with said at least one manifold for receiving hydraulic oil and applying force to said plurality of pistons, and further wherein said first plurality of channels are in fluidic communication with said plurality of cavities; and

a second recess in a sidewall of each of said plurality of pistons for receiving hydraulic oil from said first plurality of channels.

4,544,286

BEARING SEAL WITH DUAL SEALING LIPS

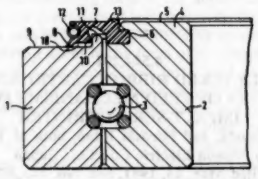
Helmut Basener, Hochstadt, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,879

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408664

Int. Cl.⁴ F16J *15/32, 15/34;* **F16C** *33/72*

U.S. Cl. 384—486 **8 Claims**



1. A seal for a rolling bearing rotary joint consisting of two race rings disposed concentrically inside one another and between which rolling members roll, one race ring projecting axially beyond the other race ring and carrying an elastic gasket in this part projecting beyond the other race ring, the gasket being disposed in a peripheral groove which is open towards the other race ring and bearing slidingly against the other race ring, characterized in that the elastic gasket (7) has an axial sealing lip (8) bearing against the end face (9) of the other race ring (1) which has an axially outwardly extending peripheral collar (11) between the point of contact of said sealing lip and its surface facing the one race ring (2), against which peripheral collar (11) there bears a second radially acting sealing lip (10) of the elastic gasket (7).

4,544,287

PRINTING CONTROL APPARATUS FOR A LABEL PRINTER, METHOD OF USING THE APPARATUS, AND A LABEL USED IN CONJUNCTION WITH THE APPARATUS

Kazuharu Teraoka, Tokyo, Japan, assignor to Teraoka Seikosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 230,004, Jan. 30, 1981, Pat. No. 4,422,376. This application Aug. 10, 1983, Ser. No. 521,902

Claims priority, application Japan, Feb. 16, 1980, 55-19016[U]; Jul. 18, 1980, 55-98882; Jul. 22, 1980, 55-103394; Sep. 2, 1980, 55-15104

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—120 **18 Claims**

1. A printing assembly for printing labels using a printer controlled by a printing control apparatus, said assembly comprising:

(a) a printer comprising:

(i) a thermal head having a plurality of thermal elements which are disposed transversely to the direction of travel of said labels;

(ii) means for placing said head into contact with a printable surface of a thermosensitive color label;

(iii) means for energizing said thermal elements in accordance with printing information received from said printing control apparatus;

(iv) means for transporting said label parallel to said printable surface and perpendicularly to said transversely disposed thermal elements for printing predetermined indicia on said label; and

(b) a printing control apparatus including:

(i) means for selectively preventing said thermal head from being placed into an operative printing condition, wherein said means for selectively preventing said thermal head from being placed into an operative printing condition comprises means for moving said thermal head into contact with and away from a label at any point along said label, wherein said moving means comprises means for bringing said thermal head into contact with said label at any point therealong when said thermal elements are energized and maintaining said head away from said label at any point therealong when said thermal elements are de-energized; and

(ii) means for controlling the feed rate of transport of said label by transporting said label at a first rate when said thermal head is maintained away from said label and at a second rate when said thermal head is in contact with said label, wherein said first rate is substantially greater than said second rate.

4,544,288

IMPACT DOT PRINTING HEAD

Hirofumi Suzuki; Masahiko Waki, and Kunimitsu Harada, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,817

Claims priority, application Japan, Nov. 29, 1982, 57-208811

Int. Cl.⁴ B41J *3/10*

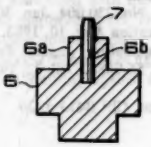
U.S. Cl. 400—121 **3 Claims**

1. In an impact dot printing head of the type in which an armature is secured to a front face of a free end of a spring plate which is supported at the opposite end thereof, and a printing

needle is inserted into a hole formed in a front face of said armature, and secured thereto, the improvement wherein:

(a) said hole defines inner surfaces which are plated with nickel;

(b) said printing needle includes outer surfaces plated with



nickel said nickel plating being chemically plated with a nickel-phosphorous alloy;

(c) said printing needle being located in said armature hole in assembled relation, said printing needle being soldered to said armature and said outer surfaces being soldered to said inner surfaces.

4,544,289

PRINT DISK POSITIONING SYSTEM

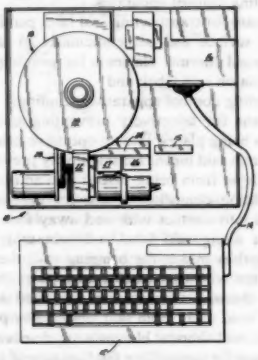
Thomas K. McGourty, and Lawrence F. McGourty, both of Pas Robles, Calif., assignors to Varitronic Systems, Inc., Eden Prairie, Minn.

PCT No. PCT/US84/00095, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984, PCT Pub. No. WO85/03255, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 20, 1984, Ser. No. 584,434

Int. Cl.⁴ B41J *1/28*

U.S. Cl. 400—154.5 **8 Claims**



1. A print disk positioner for use in an impact printer employing a disk having characters thereon to be printed comprising:

(a) a planar rail member having first and second ends and a slot therethrough extending a predetermined distance between the ends,

(b) a first electric stepping motor attached to said rail toward one end thereof and having a shaft with a pinion gear extending out of said motor,

(c) a second electric stepping motor having a plurality of bearings attached thereto and in slideable engagement with said rail, said second motor having a second shaft extending therefrom through said slot to the other side of said rail to receive the print disk,

(d) a connecting arm with rack teeth affixed to said second motor at one end and engaging said pinion gear for moving said second motor up and down said rail in response to rotation of said first shaft; and

(e) means biasing said rack into engagement with said pinion gear.

4,544,290

APPARATUS FOR MOUNTING A DAISY WHEEL IN A DAISY WHEEL PRINTER

Theodorus A. Schuiling, Wijchen, and Gijsbertus B. Morsing, Heumen, both of Netherlands, assignors to Daisy Systems Holland B.V., Netherlands

Filed Mar. 30, 1984, Ser. No. 595,345

Claims priority, application Netherlands, Apr. 7, 1983, 8301217; Nov. 18, 1983, 8303972

Int. Cl.⁴ B41J *1/30*

U.S. Cl. 400—175 **14 Claims**

1. Apparatus for mounting a daisy wheel with a wheel side in a daisy wheel printer on a shaft driven by a motor, said printer comprising a carriage which supports the motor and the driven shaft wherein said drive shaft carries a driving head with three head sides formed as an equilateral triangle at its free end and the daisy wheel is provided with a coupling member adapted to be coupled in a fixed manner with the driving head and to be removed from said driving head by moving the daisy wheel in a substantially radial direction, wherein a locking means is provided which locking means is movable between a release position in which the daisy wheel is movable in a substantially radial direction with respect to the driving head, and a working position in which the daisy wheel is locked on the driving head, said locking means including two ribs formed in a V-shape on the wheel side, which ribs engage two head sides in the operating position of the daisy wheel.

4,544,291

INVERTIBLE INKED RIBBON CARTRIDGE HAVING TWO SETS OF FEED MECHANISMS FOR AN IMPACT-SERIAL PRINTER

Muneyoshi Nagata, and Hiroshi Kano, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Japan

Filed Mar. 13, 1981, Ser. No. 243,289

Claims priority, application Japan, Mar. 13, 1980, 55-31950; Sep. 29, 1980, 55-135443

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **9 Claims**

1. An inked ribbon cartridge comprising:

an inked ribbon for use in printing by an impact-printer;

a casing for housing said inked ribbon, said casing having first and second surfaces;

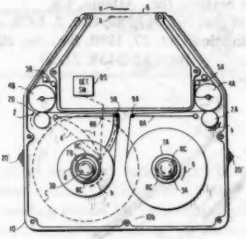
first and second core means rotatably supported by said casing, terminal ends of said inked ribbon being secured to said first and second core means, said inked ribbon being wound around said first and second core means;

first and second feed drive means spaced from said first and second core means, said first and second feed drive means being spaced laterally apart from one another, said first and second feed drive means being respectively associated

with said first and second core means for alternately feeding said inked ribbon towards its associated core means;

first coupling means on said first feed drive means for coupling with the printer to transmit rotational power through said first surface of said casing; and

second coupling means on said second feed drive means for coupling with the printer to transmit rotational power through said second surface of said casing when said cartridge is inverted;



wherein each of said first and second feed drive means includes first and second feed drive rollers, first and second feed driven rollers, and spring means for pressing said first and second feed driven rollers against said first and second feed drive rollers, respectively, said inked ribbon being pinched between at least one of said feed drive rollers and said corresponding feed driven roller.

4,544,292

MULTISTRIKE RIBBON

Ulrich Kohle, Frauenfeld, Switzerland, and Hans Paffhausen, Ruthvin by Huntly, Scotland, assignors to Pelikan AG, Hanover, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,844

Claims priority, application Switzerland, Apr. 7, 1982, 2165/82

Int. Cl.⁴ B41J *31/02*

U.S. Cl. 400—241.2 **3 Claims**

1. In an overstrike ribbon having enhanced strikeover capacity and comprising a polyester, polyethylene, polypropylene or polyamide carrier foil provided with a color transfer layer wherein the color transfer layer comprises a binder matrix of a synthetic resin in which a coloring paste is disposed for limited transfer to a print-receiving surface, the improvement wherein said coloring paste comprises at least one polyethoxylated fatty acid ester of a polyhydric alcohol forming an oleaginic phase in which a coloring agent in the form of an oleophilic dyestuff is dissolved, said polyethoxylated fatty acid ester being selected from the group which consists of polyoxyethylene-(40)-sorbite pentaoleate hexaoleate, heptaoleate and octaoleate and further contains a finely divided solid filler having a high internal surface area and a particle size distribution of 0.2 to 20 microns so that twelve and more strikeovers can be effected with high definition transfer, said filler being selected from the group which consists of diatomaceous earth, precipitated silica, active carbon and/or broken microspheres.

4,544,293

PRINTER APPARATUS AND CUTTING MECHANISM

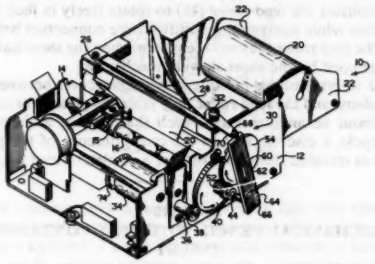
Dean H. Cranston, and Charles M. Myers, both of Riverton, Wyo., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 11, 1984, Ser. No. 619,524

Int. Cl.⁴ B41J *25/30, 11/70*

U.S. Cl. 400—320 **14 Claims**

1. A printer apparatus comprising a printhead for printing on a data carrier, a printhead carrier for moving said printhead along a path, a cutter mechanism for cutting the data carrier upon command, a bi-directional drive means having an output shaft operable to be driven in a first direction and in a second direction, opposite said first direction, a one-way clutch means operatively associated with said output shaft for actuating said cutter mechanism and driving said printhead carrier, said drive means when effecting rotation of said output shaft in said first direction effecting movement of said printhead carrier and printhead along said path and when effecting rotation of said output shaft in said second direction effecting actuation of said cutter mechanism to cut said data carrier, said one-way clutch means being ineffective to actuate said cutter mechanism when said drive means rotates said output shaft in said first direction, control means for controlling the degree of rotation of said shaft upon movement of said shaft in said second direction by



said drive means, and means for establishing a reference signal indicative of a desired predetermined degree of rotation of said shaft which is indicative of a desired actuation of said cutter mechanism and wherein said control means is operable to sense the movement of said drive means, compare said sensed movement of said drive means with said reference indicative of a desired predetermined degree of rotation of said shaft to control said drive means to limit the rotation of said shaft in said second direction to a predetermined degree of rotation indicated by said reference signal which actuates said cutter mechanism to cut only a portion of said data carrier and wherein said portion of said data carrier cut is proportional to the predetermined degree of rotation of said shaft.

4,544,294

SHEET SUPPLY APPARATUS FOR TYPEWRITERS, HAVING SLEWING ROLLERS ENGAGING A PLATEN ROLL, AND METHOD

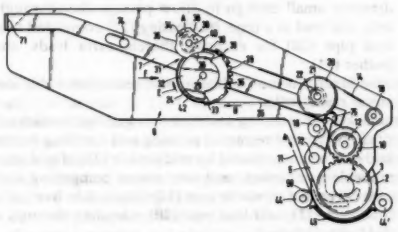
Kurt Rünzi, Küsnachterstrasse 59, CH-8126 Zumikon, Switzerland

Continuation of Ser. No. 536,863, Sep. 29, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 718,836

Claims priority, application Switzerland, Oct. 6, 1982, 5863/82

Int. Cl.⁴ B41J *13/02;* **B65H** *5/26*

U.S. Cl. 400—636.2 **22 Claims**



1. Method of supplying single sheets in feed cycles to an

automatic typewriter apparatus, output printer apparatus, or like apparatus, having

a platen (2) rotatable in a sheet feeding direction to transport sheets thereto and thereabout by a sheet slewing mechanism (44, 44', 45) comprising the steps of

establishing a positive drive connection between the platen (2) and a supply or feed roller (15) in frictional engagement with a sheet (11) for positively driving the supply or feed roller (15) from the platen through a positive feed path in said sheet feeding direction;

establishing the length of the positive feed path to be shorter than the length of the sheet and extending essentially only from the front portion of the sheet to the sheet slewing mechanism of the apparatus;

permitting the feed roller (15) to rotate freely in feed direction while interrupting positive drive connection between the feed roller (15) and the platen when the sheet has been gripped by the sheet slewing mechanism;

and re-establishing positive drive connection between the platen and the feed roller only after the platen has rotated about an angular extent such that, during a sheet feed cycle, a discrete area of the circumference of the platen has traveled through a path of a predetermined length.

4,544,295

MECHANICAL PENCIL WITH SELF-CONTAINED INSERT

Yasuyuki Hashimoto, Hyogo, and Kazuo Shimizu, Osaka, both of Japan, assignors to Ancos Co., Ltd., Osaka, Japan

Filed Jun. 3, 1983, Ser. No. 500,755

Claims priority, application Japan, Jun. 3, 1982, 57-81605[U]

Int. Cl.⁴ B43K *24/08, 21/22*

U.S. Cl. 401—65 **13 Claims**

1. An internal mechanism for a pencil barrel of a mechanical pencil, said pencil barrel having a front opening and a rear opening at front and rear ends, respectively, said internal mechanism comprising:

a first movable mechanism including an inner fitting (14) having an opening through which a lead is supplied and a clamp support (13) coupled to said inner fitting,

first biasing means for biasing said first movable mechanism rearwardly,

lead holding means (17) mounted in said inner fitting (14) for holding the lead with a light force,

a cylindrical clamp (18) located behind said lead holder (17) and movable back and forth by a short distance in said first movable mechanism,

a second movable mechanism including a chuck (19) cooperating with said cylindrical clamp (18), a lead pipe (20) connected to a rear end of said chuck (19) and having a diameter small enough to allow passage therethrough of only one lead at a time, lead casing (22) connected to said lead pipe (20) for encasing therein extra leads, and a pusher (21),

second biasing means for biasing said second movable mechanism rearwardly,

cam means for retaining said first movable mechanism selectively between a retracted position and a writing position, said cam means actuated by said pusher (21) of said second movable mechanism, said cam means comprising a slide cam (11) and a rotatable cam (12) disposed in front of said slide cam (11), said lead pipe (20) extending through said slide cam (11),

a cam cylinder (9) incorporating therein said cam means, and means for holding said cam cylinder stationary with respect to the pencil barrel during operation of said internal mechanism, whereby said internal mechanism is wholly self-contained.

4,544,296

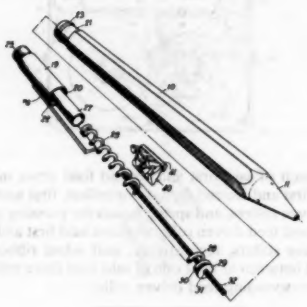
DISPOSABLE PROPEL-REPEL PENCIL

William A. Jarvis, Dunwoody, Ga.; John Kirby, S. Hamilton, Mass.; Alan J. Lane, Lexington, Mass.; John P. Pokorski, Chelmsford, Mass., and Wilbur L. Sheffield, Needham, Mass., assignors to Scripto, Inc., Atlanta, Ga.

Continuation of Ser. No. 947,580, Oct. 2, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 200,786

Int. Cl.⁴ B43K *21/08*

U.S. Cl. 401—73 **14 Claims**



1. A writing instrument adapted to contain a marking element therein comprising a barrel having a forward and rear end and internal wall portions forming a main internal bore, a flexible spiral coil positioned within said bore and adapted for manual rotation therein, a plurality of longitudinally extending ribs positioned within said bore for laterally supporting the exterior configuration of said spiral coil and a unitary marking element positioning means operatively positioned within said bore in captive relation between an internal wall portion of said barrel and the external configuration of said coil and restrained for longitudinal movement within said bore in response to rotation of said coil, said marking element positioning means being located between two of said ribs and restrained thereby for such longitudinal movement, said marking element positioning means having forwardly and rearwardly facing portions and an integrally formed stop member positioned between said portions and adapted to engage a marking element inserted into either of said portions and to arrest the rearward movement thereof relative to said marking element positioning means, each of said forwardly and rearwardly facing portions including an integrally formed bifurcated element having elastic and laterally yieldable elements disposed within said coil and adapted to engage and frictionally grip a marking element inserted between the bifurcations so that the marking element can be projected or retracted with respect to the said barrel by the selected manual rotation of said coil.

4,544,297

BALL POINT PEN VENTING

Claude R. Grosslord, Annecy, France, assignor to S. T. Dupont, Paris, France

Filed Dec. 30, 1983, Ser. No. 567,258

Claims priority, application France, Dec. 30, 1982, 82 22062

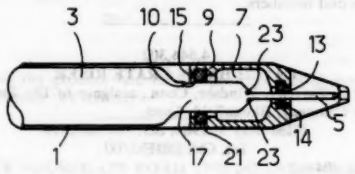
Int. Cl.⁴ B43K *7/00, 7/08, 7/12*

U.S. Cl. 401—217 **6 Claims**

1. In a ball point pen having an ink cartridge with a writing nib slidably mounted in the body of the pen and translatable between a resting position wherein said nib is retracted within the body of the pen and a writing position wherein said nib is

disposed outside of the pen body, said ink cartridge being provided in the vicinity of said nib with at least one orifice for supplying said ink cartridge with air, the improvement comprising:

a chamber sealed from the ambient atmosphere in both said



resting position and said writing position, said orifice being disposed within said chamber; and

interruptable sealing means for establishing communication between said chamber and the ambient atmosphere whenever said ink cartridge is translated between said resting and writing positions.

4,544,298

HOLDING ELEMENT FOR SHEETS OF PAPER AND SIMILAR MATERIALS

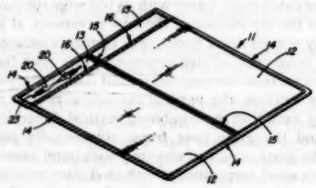
David G. Gestetner, 952 Antonine Maillet, Outremont, Montreal, Quebec, Canada H2V 2Y9

Filed Oct. 17, 1983, Ser. No. 542,610

Claims priority, application Canada, Aug. 3, 1983, 433732

Int. Cl.⁴ B42F *3/00, 13/02, 13/00*

U.S. Cl. 402—19 **6 Claims**



1. A plastic resilient holding element adapted to hold a series of sheets of paper or similar material thereon, the sheets each having a pair of apertures therein of selected size and separation distance, the holding element having a generally planar configuration and having a pair of prong-like members cut therein, the prong-like members extending generally in-line with each other such that the members point generally toward each other, each prong-like member being integrally attached by one of its ends to the remainder of the holding element without diminution at the point of attachment, the remainder of the holding element being adapted to arcuately flex under bias around an axis extending normal to the longitudinal axis of the prong-like members to extend those members out of the arcuate surface of the remainder of the holding element, the separation distance between the one ends of the prong-like members being generally the same as the separation distance between the apertures in the sheets of paper or similar material, whereby when the holding element is flexed such that the prong-like members extend out of the arcuate surface of the remainder of the holding element each of the prong-like members can be extended through a respective one of the apertures in the sheets, the prong-like members after release of the bias acting to return to the plane of the remainder of the holding element and thereby holding the sheets against the remainder of the holding element.

4,544,299

TRACTION- AND PRESSURE-TRANSMITTING LINK JOINT BETWEEN TWO STRUCTURAL COMPONENTS EXECUTING JOINT MOVEMENTS

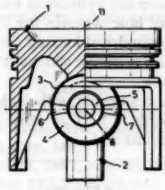
Hermann Danckert, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,649

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226817; May 19, 1983, 3318215

Int. Cl.⁴ F16J *1/16;* F02F *3/24*

U.S. Cl. 403—150 **4 Claims**



1. A traction- and pressure-transmitting link joint between two structural components executing joint movements, comprising a cylindrical pin, a first structural component having a substantially semi-cylindrical bearing surface engaging the surface of the pin and lying on one side of the pin axis, a second structural component having a substantially semi-cylindrical bearing surface engaging the surface of the pin on the opposite side of the pin axis from the first structural component bearing surface engagement, the entire bearing surface regions of the first and second structural components lying on opposite sides of the pin axis and the total portion of the circumference of the pin engaged by the bearing surfaces being less than 360°, and at least one ring surrounding the pin and the bearing surface portions of the first and second components and retaining the first and second component bearing surfaces in engagement with the surface of the pin wherein the ring is mounted to permit lateral displacement of the first and second components in the direction of the axis of the pin.

4,544,300

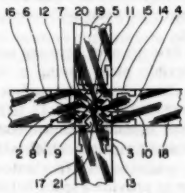
SLIDE CONNECTORS WITH LOCKING MEANS

Hyok S. Lew, and Yon S. Lew, both of 7890 Oak St., Arvada, Colo. 80005

Filed Apr. 7, 1983, Ser. No. 465,108

Int. Cl.⁴ F16B *5/00*

U.S. Cl. 403—170 **6 Claims**



1. A slide connector with locking means for connecting a plurality of boards in L, T or cross connection, said slide connector comprising in combination:

(a) a four-sided elongated member including four retaining slide grooves disposed respectively on said four sides of said elongated member longitudinally, the cross section of each of said retaining slide grooves including a narrowed-down opening disposed on each of said four sides of said elongated member and a bottom of substantially V-shaped cross section disposed adjacent to the geometric center of the cross section of said elongated member,

(b) at least one locking hole of a finite depth disposed at least at one end of said elongated member, said locking hole having a perimeter slightly over-lapping into said bottom of substantially V-shaped cross section of said retaining slide grooves;

(c) a plurality of retaining slide rails rigidly affixed to ends of a plurality of boards, respectively, each of said retaining slide rails having a cross section matched to the cross section of said retaining slide groove including a narrowed-down root and a ridge, said retaining slide rails slidably engaging said retaining slide grooves included in said elongated member; and

(d) at least one generally cylindrical locking member engaging said locking hole wherein the cylindrical surface of said generally cylindrical locking member interferes with said ridges of said retaining slide rails engaging said retaining slide grooves;

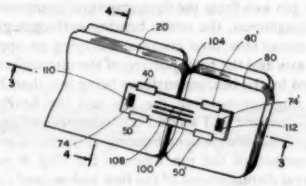
whereby, said slide connector with locking means connects said plurality of boards in L, T or cross connection in a substantially rigid relationship.

4,544,301

KEYBOARD ASSEMBLY

Ralph J. Lake, Jr., Somerville; John Steckowich, Jr., Edison, and Stephen R. Solomon, Cranford, all of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1982, Ser. No. 437,969
Int. Cl.[4] F16B *5/00*
U.S. Cl. 403—300 **4 Claims**



1. Coupling apparatus comprising

first and second plate-like members to be coupled together,

said first member having a top surface for supporting a keyboard and a bottom surface,

said second member having a top surface for supporting a key pad and a bottom surface,

the bottom surface of said first member carrying two spaced-apart coupling plates which are parallel to each other and are spaced above the bottom surface of said first member to provide a space between said coupling plates and said bottom surface,

the body of said first member between said coupling plates including a flexible plate having a raised locking tab which extends above the bottom surface of said first member,

the bottom surface of said second member carrying two spaced-apart coupling plates which are parallel to each other and are spaced above the bottom surface of said second member to provide a space between said coupling plates and said bottom surface,

the body of said second member between said coupling plates including a flexible plate having a raised locking tab which extends above the bottom surface of said second member, and

a rigid plate-like coupling member having first and second ends and a first slot at said first end and a second slot at said second end,

said slots having substantially the same shape and area as said raised locking tabs,

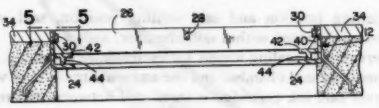
said rigid plate-like coupling member being adapted to have said first end inserted under the coupling plates of said first member with the locking tab thereof seated in said first slot to lock the coupling member in place,

said rigid plate-like coupling member being adapted to have said second end inserted under the coupling plates of said second member with the locking tab thereof seated in said second slot to lock the coupling member in place and thereby to secure said coupling member to said first and second members.

4,544,302

CATCH BASIN GRATE RISER

Robert E. Farrelly, Windsor, Conn., assignor to The Jack Farrelly Company, Bloomfield, Conn.

Filed May 7, 1984, Ser. No. 607,614
Int. Cl.[4] E01F *5/00*
U.S. Cl. 404—2 **8 Claims**

1. A grate riser for use with catch basins and the like during road repaving operations, the catch basins comprising vertically open generally rectangular frames with at least two opposing frame sections carrying inwardly projecting horizontal grate support flanges and cooperating grates with opposite end portions of parallel spaced apart elongated horizontal grate elements adapted to rest on said flanges; and the grate riser comprising a vertically open generally rectangular frame coextensive with a catch basin frame and with opposing vertical side and end wall sections of a height substantially equal to the depth of new road pavement, said frame being adapted to rest atop the catch basin frame with its top edge substantially in the plane of the top surface of the new pavement, at least two horizontally spaced apart upper riser elements secured to and depending from each of two opposing grate riser frame sections, which sections correspond to said flange carrying catch basin frame sections, the vertical dimension of said riser elements being such that the combined vertical dimension of the elements and the grate riser frame substantially equals the height of the grate, a pair of elevated horizontal grate support flanges associated respectively with said two opposite grate riser frame sections and connected with said riser elements at lower end portions of the latter, and at least one lower riser element connected with each of said grate riser support flanges and depending therefrom, the vertical dimension of said lower riser elements being substantially equal to the height of the grate riser frame and said elements serving to support the grate riser and a grate thereon when they are supported atop the grate support flanges on the catch basin frame, and said upper riser elements being so spaced as to reside between end portions of elongated horizontal grate elements when the grate is disposed atop the said elevated grate support flanges on said grate riser frame.

4,544,303

PROTECTIVE TRAFFIC BARRIER

Samuel G. Glasmire, 1438 Westgate Dr., Bethlehem, Pa. 18017

Filed Jul. 29, 1983, Ser. No. 518,545
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **13 Claims**

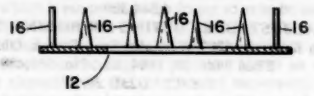
1. A protective traffic barrier comprising:

(a) a generally square planar base having a top and a bottom;

(b) a generally circular opening proximate said base center, said circular opening having a radius generally two-thirds the distance from center to base outer edge; and,

(c) a plurality of wedge-shaped projections concentrically arranged between said opening's perimeter and said base outer edge and extending upward from said top,

whereby when said barrier bottom is placed on a ground surface with said opening over an object projecting up



from the ground, said barrier protects said object from vehicular tire damage.

4,544,304

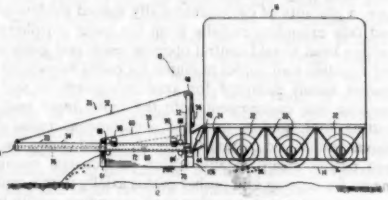
ICE AGGREGATE ROAD AND METHOD AND APPARATUS FOR CONSTRUCTING SAME

Edwin N. Fisher, Belle Center, Ohio, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 176,554, Aug. 8, 1980, Pat. No. 4,440,520. This application Oct. 3, 1983, Ser. No. 538,699

Int. Cl.⁴ E01C *3/06*

U.S. Cl. 404—17 **12 Claims**



4. Apparatus for constructing an ice aggregate road, which comprises:

means adapted to receive ice aggregate and distributing the ice aggregate over a portion of the route desired for said road; and

means operatively coupled to said receiving and distributing means for applying bond water to the top surface of the distributed ice aggregate; said means for applying bond water including means for preventing evaporative cooling of said bond water before it reaches said top surface.

4,544,305

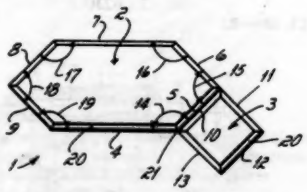
INTERLOCKING SLAB ELEMENT FOR COVERING THE GROUND AND THE LIKE

Roberta A. Hair, 7554 Wooster Rd., Cincinnati, Ohio 45227

Filed Feb. 1, 1984, Ser. No. 575,984

Int. Cl.⁴ E01C *5/06*

U.S. Cl. 404—41 **21 Claims**



1. A slab element for covering the ground or other like surface comprising:

a main hexagonal section and at least one substantially square tail section integral therewith which are oriented in substantially one plane;

said main section having a first pair of adjoining minor peripheral faces and a second pair of adjoining minor peripheral faces, wherein said first and second pairs of minor faces are oppositely disposed in spaced-apart relationship; said main section further having a pair of spaced-apart, parallel major peripheral faces interconnecting said first and second pairs of minor faces;

said tail section having four minor peripheral faces wherein each of said four minor faces adjoins two other of said four faces with one of said four minor faces of said tail portion being substantially coextensive in size and shape and spatially coincident with one of said minor faces of said main section, and

each of the said major faces having a length approximately twice the length of each of said minor faces.

4,544,306

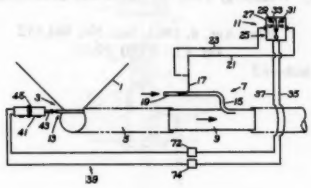
AUTOMATIC UNLOADING OUTLET ASSEMBLY

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.

Filed Feb. 18, 1982, Ser. No. 349,789

Int. Cl.⁴ B65G *53/66*

U.S. Cl. 406—30 **5 Claims**



1. An automatic unloading system for pneumatic discharge of particulate material comprising: pressure sensing means provided to at least periodically determine the pressure drop between at least one pneumatic discharge outlet and a point in a pneumatic discharge conduit downstream from the pneumatic outlet, said pressure sensing means sensing corresponding changes in pressure drop in the discharge conduit resulting from more or less particulate material being discharged through the discharge conduit, said pressure sensing means being connected to control means for controlling the opening and closing of one or more pneumatic discharge outlets in fluid communication with the discharge conduit, wherein the pressure sensing means comprises a bleed air conduit, open to the atmosphere, connected into the discharge conduit downstream of the discharge outlet said discharge conduit creating a suction in said bleed air conduit, and a pitot tube located in said bleed air conduit to measure the pressure drop.

4,544,307

DRILLING JIG FOR FLATHEAD SCREW PILOT HOLES

Aaron B. Miller, P.O. Box 2378, Palson, Mont. 59860

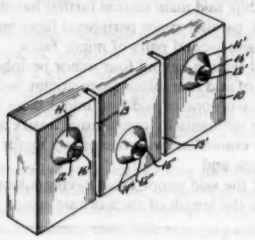
Filed May 31, 1983, Ser. No. 499,435

Int. Cl.⁴ B23B *49/02*

U.S. Cl. 408—72 B **2 Claims**

1. A drilling jig for alignment of drilled pilot holes relative to a workpiece having a pattern of bevelled countersunk recesses that receive flathead screws, said drilling jig comprising: an elongate generally rectangular plate having generally parallel upper and lower surfaces; said lower surface having a plurality of truncated conical protuberances arranged in said pattern and extending from said lower surface to be received simultaneously in the countersunk recesses of the workpiece; said plurality of protuberances each having a cross section complementary in shape to the cross section of the countersunk recesses so that said lower surface is juxtaposed with the workpiece surface when the drill jig is positioned thereon; and a plurality

of through holes, corresponding to said plurality of protuberances, extending perpendicularly to said upper and lower



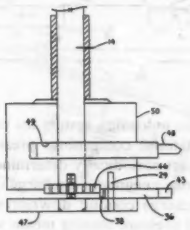
surfaces, each hole being centered relative to a corresponding protuberance.

4,544,308

BORING HEAD CENTERING APPARATUS

Russell C. Westberg, 5100 W. 106th St., Bloomington, Minn. 55435

Filed Apr. 4, 1983, Ser. No. 481,812
Int. Cl.⁴ B23B *29/03*
U.S. Cl. 408—82 **5 Claims**



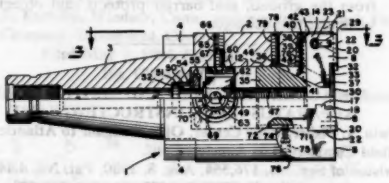
1. A boring head centering apparatus for centering a boring head within a cylinder which comprises a cylindrical boring head carrier having a central bore, a cylindrical boring head connected to said carrier and having a rotary axis on the rotary axis of said boring head carrier, said boring head having a first cavity, a centering pinion mounted within the bore of said carrier and extending into said first cylindrical cavity, said centering pinion having gearing at an end of said centering pinion positioned in said first cavity, said boring head having a second cavity opening into said first cavity and a third cavity opening into said second cavity, an idler pinion mounted within said second cavity and in operative contact with the gears of said centering pinion, a boring head pinion mounted in said third cavity in operative contact with said idler pinion and extending beyond said boring head, said boring head pinion having means for securing the boring head pinion within said third cavity, a centering gear mounted on said boring head and having a rotary axis along the axis of said boring head and carrier axis and in operative connection with said boring head pinion, at least three centering fingers mounted at equal distances about the periphery of said boring head, each of said fingers having gear teeth on a first end in operative contact with said centering gear, finger pins mounted in said boring head, said fingers mounted on said finger pins at said first end, a boring head plate connected to said boring head to capture the fingers between the plate and the boring head and means to rotate said centering pinion and transmit rotary motion through said centering pinion, idler pinion, boring head pinion, and centering gear to said fingers to move the fingers outwardly in an arc from said boring head and into contact with the walls of said cylinder.

4,544,309

ADJUSTABLE CUTTING OR BORING TOOL

Dragisa Krstovic, 6307 Westlake Ave., Parma, Ohio 44129

Filed Mar. 29, 1984, Ser. No. 538,488
Int. Cl.⁴ B23B *29/02*
U.S. Cl. 408—157 **20 Claims**



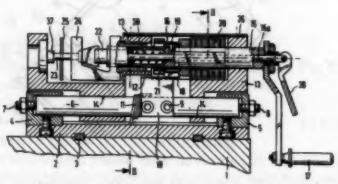
1. A cutting tool comprising a cutting head having a generally radially extending end face at one end, a central opening extending longitudinally into said cutting head from said end face, a plurality of circumferentially spaced guideways in said end face extending radially from the outer periphery of said cutting head to said central opening, each said guideway having a cutting tool holder mounted for radial movement therein, pusher means mounted for axial movement in said central opening into engagement with the radial inner ends of said cutting tool holders to cause simultaneous radial outward movement of said cutting tool holders, and means for moving said pusher means axially within said central opening, said means for moving said pusher means axially within said central opening comprising a pusher shaft extending axially inwardly from said pusher means, means for rotating said pusher shaft in said central opening, and means for causing axial movement of said pusher means in response to such rotation of said pusher shaft, said means for rotating said pusher shaft comprising a first bevel gear keyed to said pusher shaft, and a second bevel gear extending at right angles to said first bevel gear and in meshing engagement therewith, said second bevel gear being accessible for rotation through a radial opening in said cutting head, and a pilot member in said central opening surrounding said pusher shaft, said pilot member being secured in place within said central opening and having a flat face on one side which provides a bearing support for said second bevel gear.

4,544,310

CLUTCH AND TRANSMISSION MECHANISM

Esko Tyynelä, Reijola, and Tuomo Pitkänen, Joensuu, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Jul. 12, 1983, Ser. No. 513,157
Claims priority, application Finland, Jul. 19, 1982, 822535
Int. Cl.⁴ B23C *3/35*
U.S. Cl. 409—82 **12 Claims**



1. A mechanism for receiving an elongated object, such as a key blank, that is to be machined to a desired shape at a plurality of successive positions in an axial direction of said object, comprising a frame, a holder for carrying the object in a prede-

termined orientation with respect to the frame, and a transfer device for moving the holder with respect to the frame in the axial direction of the object when carried in said predetermined orientation, said transfer device comprising:

a support which is mounted to the frame so as to be movable with respect thereto in the axial direction of the object when carried in said predetermined orientation;

a shaft mounted in the support to rotate about an axis of rotation aligned with the direction of movement of the support but being fixed against axial movement relative to the support, the shaft being connected to the holder for transmitting rotational movement thereto;

a first clutch member which is stationary relative to the support with respect to the axial direction of the shaft;

a second clutch member which is stationary relative to the frame with respect to the axial direction of the shaft and is engageable by the first clutch member to lock the shaft and the support against axial movement relative to the frame; and

a feeder member which is connected to the rotatable shaft and which co-operates with the first clutch member so that said first clutch member is disengaged from the second clutch member during only a small range of angular positions of the rotatable shaft, thereby permitting axial movement of the rotatable shaft and the support during said small range of angular positions, and is engaged with the second clutch member, thereby preventing axial movement of the rotatable shaft and the support, at angular positions of the shaft outside said small range of angular positions, said feeder member engaging the second clutch member during only said small range of angular positions of the rotatable shaft, whereby co-operating guiding surfaces of the feeder member and of the second clutch member transmit an axial movement to the rotatable shaft and to the support during rotation of the shaft through said small range of angular positions.

4,544,311

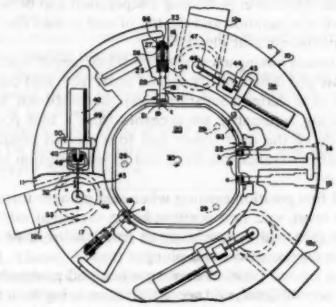
MASK ALIGNMENT APPARATUS

Anwar Husain, Mt. View, Calif., assignor to Micronix Partners, Los Gatos, Calif.

Filed Mar. 15, 1983, Ser. No. 475,427

Int. Cl.⁴ B23Q *3/06*; B23B *31/10*

U.S. Cl. 409—224 **20 Claims**



1. A mask alignment apparatus comprising an annular member having an aperture for mounting a mask thereacross;

means for mounting a mask within said aperture;

a fixed support means; and

alignment means for moving said member with respect to said support means in x-axis and y-axis coordinates and in rotative directions, said alignment means including linear motor means having a linearly moving shaft, said motor means being attached to said member and a flexible linkage between said shaft and said fixed support means, such that movement of said shaft moves said member with respect to said fixed support means to spacially position said mask.

4,544,312

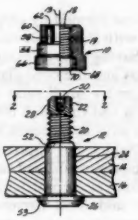
PIN AND PROCESS FOR ITS MANUFACTURE

Edgar L. Stencel, Huntington Beach, Calif., assignor to VSI Corporation, Pasadena, Calif.

Continuation of Ser. No. 244,827, Mar. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 849,756, Nov. 9, 1977, Pat. No. 4,260,005. This application Dec. 24, 1984, Ser. No. 685,957

Int. Cl.⁴ F16B *39/02, 39/28*

U.S. Cl. 411—3 **9 Claims**



1. In combination, a pin and a collar comprising:

(a) the collar having:

an internally threaded axial bore and external, longitudinally extending lobes on its outer surface, the lobes being capable of failing plastically in radial compression upon the application of a predetermined load onto them, the load being effected by a driving tool and at least one reacting sheet while threading the collar onto the pin to plastically displace collar material radially inward into the axial bore and into locking relationship with the pin;

(b) the pin having:

(i) a manufactured head at one end of the pin for applying a clamp-up load on the sheet;

(ii) a shank extending longitudinally from the head to the other end of the pin;

(iii) a plurality of regularly placed flutes extending longitudinally along the shank from the end of the pin opposite the head and ending at points spaced from the head, each flute being substantially concave outward in cross-section;

(iv) external roll-formed threads on the shank extending from the end of the pin opposite the head past the ends of the flutes and crossing over the flutes for threaded receipt by the threads of the collar, the depth of the flutes being substantially equal to the root diameter of the external threads in the flutes;

(v) a ridge crest on each side of the flutes and extending circumferentially at the major diameter of the threads, each of the ridge crests spanning a circumferential distance on the order of the distance across each flute at the major diameter; and

(vi) means to restrain the pin from rotating while threading the collar onto the pin and developing the predetermined load;

whereby, displaced collar material flows into the flutes to lock the collar to the pin upon application of the predetermined load onto the lobes.

4,544,313
SELF-TAPPING SCREW

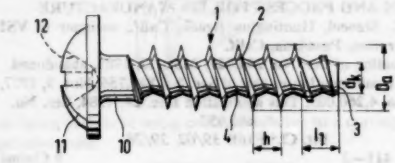
Hermann Grossberndt, Laasphe, Fed. Rep. of Germany, assignor to EJOT Eberhard Jaeger GmbH & Co. KG, Laasphe, Fed. Rep. of Germany

Continuation of Ser. No. 968,091, Dec. 8, 1978, abandoned. This application Jun. 4, 1984, Ser. No. 617,143

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754870

Int. Cl.⁴ F16B *25/00, 33/02*

U.S. Cl. 411—411 **4 Claims**



1. A self-tapping screw formed by chipless rolling comprising an elongated core with threads thereon projecting radially outwardly therefrom having a large ratio between the outside diameter of said threads and the core diameter, a small thread angle on said threads and a small ratio between said outside diameter of said threads and the pitch dimension said threads, said core between two adjacent threads being constricted, the most narrow point of which lies approximately in the center between said two adjacent threads, and said core being tapered expanding outwardly from said constriction to the bases of said two adjacent threads, said most narrow point defining the location of the measurement of said core diameter, said ratio between said outside diameter (D_a) of said threads and said core diameter (d_k) being approximately 1.85, said thread angle (α) being approximately 30°, and said ratio between said outside diameter (D_a) and said pitch (h) of said threads being approximately 2.25.

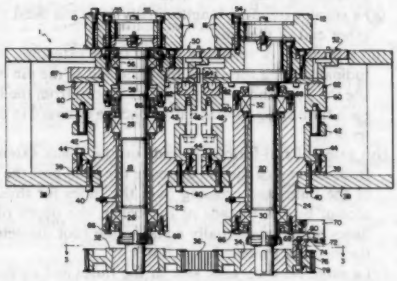
4,544,314
CAN END DIVIDER

Edward S. Partyka, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Nov. 15, 1984, Ser. No. 671,518

Int. Cl.⁴ B21D *51/00*

U.S. Cl. 413—26 **9 Claims**



1. Apparatus for dividing an input stream of can ends into a pair of output streams comprising means for spacing and feeding said can ends to a work station, a pair of star wheel means for alternately receiving said can ends at said work station from said means for spacing and feeding, and guiding said can ends from said work station, output guides associated with each of said star wheel means for receiving said can ends from said star wheel means thereby providing a pair of output streams, and means operatively connected to said means for spacing and feeding said can ends and said star wheel means for driving said means for spacing and feeding and said star wheel means in timed relation.

4,544,315
SEPARATION OF SHEET METAL ELEMENTS FROM A STACK

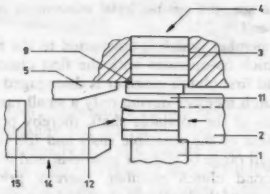
Willi Muskulus, Frankfurt, Fed. Rep. of Germany, assignor to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Nov. 23, 1982, Ser. No. 443,898

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146848; Nov. 27, 1981, 3147034

Int. Cl.⁴ B65G *59/06*

U.S. Cl. 414—115 **10 Claims**



1. Apparatus suitable for separating at least one sheet metal element from a stack of apertured sheet metal elements, comprising:

(a) guide duct means for guideably issuing said stack, said duct having a lower end from which can gravitationally issue said at least one element;

(b) plunger means lowerable so that the top thereof returnably descends from a first level to a second level, and returnably descends from said second level to a third level,

(i) said first level enabling said plunger top to support thereon said stack;

(ii) said second level providing lowering of said at least one issued element and lowering of the rest of said stack, such that a plane of separation will exist between the top of said at least one issued element and the rest of said stack above said plane;

(iii) said third level providing a separation gap between said plane of separation and the top of said at least one element that is below that plane;

(c) slide means having a leading face whose upper leading edge is below and downwardly spaced apart from said duct lower end so as to define a separation gap therebetween, said slide face being returnably advanceable from a first position at one side of the duct lower end to a second position, and returnably advanceable from said second position to a third position,

(i) said first position existing when said plunger top is at said first level, said first position being such that said leading slide face will be spaced apart from said at least one element supported on said plunger top;

(ii) said second position existing when said plunger top is at said second level, said second position being such that said slide leading face will be pushed against said at least one issued element so as to provide first sideways shifting of said at least one issued element supported on said plunger top, the top of said slide in said second position preventing descent of said stack therebelow;

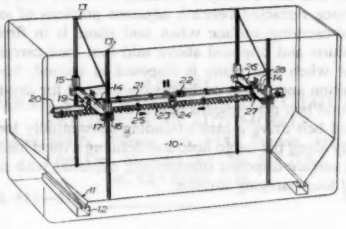
(iii) said third position existing when said plunger top is at said third level, said third position being such that said leading slide face will be pushed against said first shifted at least one issued element so as to provide second sideways shifting of and removal from said plunger top of that at least one element and wholly off of said plunger top, the top of said slide means in said third position preventing descent of said stack.

4,544,316

APPARATUS FOR AUTOMATICALLY AND CONTINUOUSLY WITHDRAWING COAL FROM A SHIP'S BUNKER

Ernst H. Herslow, Hässleholm, Sweden, assignor to Nils Weibull AB, Hassleholm, Sweden

Filed Oct. 27, 1983, Ser. No. 545,784
Int. Cl.[4] B65G *65/38*
U.S. Cl. 414—144 **6 Claims**



1. Apparatus for continuously withdrawing coal from a ship's bunker, also when the ship under way at sea, comprising in combination

at least two pairs of vertical beams fixedly connected to the ship's hull, the beams of each pair being spaced apart longitudinally of the ship;

hydraulic means on each of said vertical beams, said hydraulic means being synchronized and adapted, upon supply of pressure medium, to climb up or down on said beams;

supporting beam means extending horizontally and longitudinally of the ship and supported by said hydraulic means of each pair of vertical beams mounted longitudinally of the ship, said supporting beam means being provided each with a runway;

a gantry beam extending horizontally and transversely of the ship and having wheeled carriages fixedly spaced apart longitudinally of said gantry beam, the wheels of said carriages rolling on the runways of said supporting beam means;

means for driving the wheels on each carriage for moving said gantry beam longitudinally along said supporting beam means;

conveyor screw means suspended from said gantry beam and extending transversely;

driving means for said conveyor screw means for so rotating the latter that it conveys coal at least towards one long side of the ship; and

a discharge hopper along at least one of the long sides of the ship for taking up coal conveyed towards said side by said conveyor screw means.

4,544,317

VACUUM-TO-VACUUM ENTRY SYSTEM APPARATUS

Donald L. Carter, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,629
Int. Cl.[4] F16C *32/06*; F16J *15/40*
U.S. Cl. 414—217 **18 Claims**

1. Vacuum-to-vacuum entry system apparatus comprising:

at least two first and second vacuumized chambers,

first member means having a first planar gas bearing surface and a first another surface,

a first opening extending through said first member means between the two said first surfaces, said first chamber being disposed adjacent said first another surface, and said first opening being in a predetermined sealed communication with the interior of said first chamber,

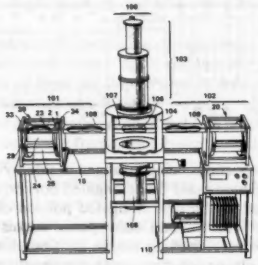
second member means having a second planar gas bearing surface in parallel facing relationship with said first gas planar surface, said second member means having a second another surface,

means for relative rotation between said first and second gas bearing surfaces about a predetermined axis, said axis being normal to said planar first and second gas bearing surfaces,

a second opening extending through said second member means between the two said second surfaces, said second chamber being disposed adjacent said second another surface, and said second opening being in a predetermined sealed communication with the interior of said second chamber,

said first gas bearing surface having a predetermined region therein offset a predetermined radial distance from said axis and not intersected by said axis, said first opening at said first gas bearing surface being disposed within said region,

gas supply means for providing a gas between said first and



second gas bearing surfaces to support axially said first and second member means with a predetermined spacing between said first and second gas bearing surfaces, and

gas sink means within a predetermined sector of said first gas bearing surface relative to said axis, said region being disposed within said sector, said gas being sinked away from said region by said gas sink means, said gas between said first and second gas bearing surfaces and said gas sink means coacting to provide a seal for said region and for a zone of said spacing, said zone extending through said spacing from said region to the plane of said second planar gas bearing surface,

said first and second gas bearing surfaces being angularly positionable about said axis by said rotation means to place said first and second openings at said first and second gas bearing surfaces, respectively, in facing alignment with respect to each other and said sealed zone to effect a sealed communication between said vacuumized first and second chambers.

4,544,318

MANUFACTURING SYSTEM

Hiroto Nagatomo, Tokyo; Hisashi Maejima, Higashiyamato; Jun Suzuki, Higashimurayama, and Keishin Fujikawa, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 168,737, Jul. 14, 1980, abandoned. This application Mar. 23, 1983, Ser. No. 477,895
Claims priority, application Japan, Jul. 27, 1979, 54-95004
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—222 **6 Claims**

1. A manufacturing system for providing a plurality of different treatments to semiconductor workpieces to manufacture semiconductor devices comprising:

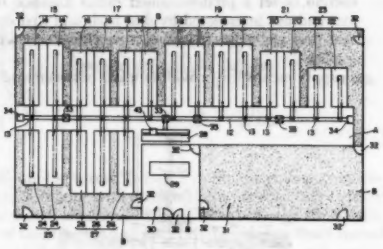
a conveyance path elongated along a predetermined path;

a plurality of treatment sections, for subjecting the workpieces to respectively different treatments, said treatment sections being elongated relative to said conveyance path in a direction to intersect said conveyance path and arranged in side-by-side spaced relationship, each of said

treatment sections having loading and unloading positions at a side facing said conveyance path; and

conveyance means for moving the workpieces towards the loading positions and unloading positions of said respective treatment sections and along with conveyance path,

the improvement wherein said plurality of treatment sections and said conveyance path are all located within a clean room area formed such that a first elongated portion of said clean room area is provided for said conveyance path and portions of said clean room area are provided for each of said treatment sections with the treatment section



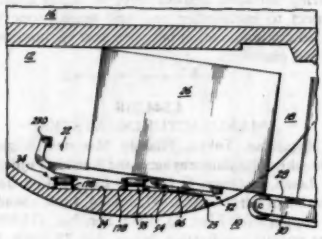
clean room portions being arranged in side-by-side spaced relationship along said first elongated portion and respectively joined to the first elongated portion of said clean room area; wherein said conveyance means includes a carrier capable of moving within the first elongated portion of said clean room area; and wherein said manufacturing system further comprises a preservation area located outside of said clean room area and adjacent to each of the treatment section clean room areas to permit access to each of said treatment sections from outside of said clean room area for repair and maintenance.

4,544,319

CARGO TRANSFER SYSTEM

Norman D. Folling, Monroe, and Donald B. Terrana, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 22, 1983, Ser. No. 534,593
Int. Cl.[4] B64C 1/22
U.S. Cl. 414—505 **23 Claims**



1. A powered cargo transfer system for an aircraft having a cargo hold and an access opening in the side of the fuselage of the aircraft for moving loads into and out of the cargo hold, said cargo transfer system comprising:

a. a tiltable conveying plane mounted on the aircraft and positioned adjacent the access opening;

b. first belt drive means mounted on said conveying plane, said first belt drive means including at least one belt conveyor oriented generally laterally to the length of the fuselage and defining a first load-carrying surface and means on board the aircraft for driving said first belt drive means belt conveyor;

c. means for tilting said plane laterally relative to the length of the fuselage between a first position wherein the side of the plane adjacent the fuselage opening is tilted downwardly from the horizontal, and a second, generally horizontal position;

d. second belt drive means positioned adjacent the access opening and oriented generally transversely to said first belt drive means, said second belt drive means including at least one belt conveyor defining a second load-carrying surface retracted beneath adjacent portions of said first load-carrying surface when said plane is in first, tilted position and disposed above said first load-carrying surface when said plane is disposed in second, horizontal position and means on board the aircraft for driving said second belt drive means belt conveyor; and

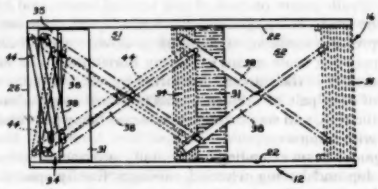
e. third belt drive means extending substantially longitudinally along the cargo hold and defining a third load-carrying surface disposed substantially coplanar with said second load-carrying surface.

4,544,320

REFUSE CONTAINER

Allan B. Haines, 24 Highfield Ave., St. Georges, State of South Australia, Australia

Filed Jul. 25, 1983, Ser. No. 516,756
Int. Cl.[4] B65F 3/28
U.S. Cl. 414—511 **7 Claims**



1. An improved refuse compactor of the type comprising a compactor body having walls defining a compaction chamber into which waste material is deposited and compacted by a packer or pusher blade assembly arranged to be guided for longitudinal back and forth movement along the length of the chamber for firstly compacting the waste material deposited in the chamber and subsequently ejecting the compacted waste material from a discharge opening at the rear of the chamber characterised by a carriage located rearwardly of said pusher blade and guided for longitudinal back and forth movement between a retracted position near the front of the compaction chamber and an extended position intermediate the front and rear ends of said compaction chamber, a first pair of fluid cylinders operatively interconnected between said carriage and said pusher blade and arranged, upon actuation thereof, to urge the pusher blade away from said carriage to permit the pusher blade to compact waste material within the chamber, and a second pair of fluid cylinders operatively interconnected between the compaction chamber at or near the front thereof and said carriage for effecting movement of said carriage between its said retracted position and its said extended position during which said movement the pusher blade and the carriage move together, wherein each said fluid cylinder has its cylinder end and its piston rod end pivotally mounted for pivotal movement about a vertical axis and wherein each said pair of fluid cylinders has its cylinders disposed in a scissors arrangement with one cylinder from each said pair of cylinders lying in a first horizontal plane above the plane of the carriage, and the other cylinder of the said pair of cylinders lying in a second horizontal plane below the plane of the carriage, the arrangement being such that compacted waste material within the compaction chamber can be ejected therefrom by actuating

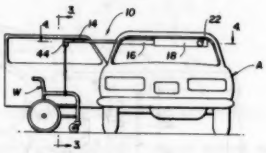
said first pair of fluid cylinders to urge said pusher blade away from the carriage to an approximate midway position along the compaction chamber, and by actuating said second pair of fluid cylinders to urge said carriage to its said intermediate position and simultaneously urge the pusher blade to a position adjacent the discharge opening of said compaction chamber.

4,544,321

APPARATUS FOR MOVING A WHEELCHAIR INTO AND OUT OF AN AUTOMOBILE

John Lanier, 201 N. Wilmot, Apt. #142, Tucson, Ariz. 85711

Filed Oct. 26, 1983, Ser. No. 545,213
Int. Cl.⁴ B60P *1/54*
U.S. Cl. 414—542 **5 Claims**



1. Apparatus for moving a wheelchair into and out of the space behind the seat of an automobile, comprising:

a wheelchair support assembly mounted on the roof of the automobile behind the front seat thereof, said support assembly being movable between an outer position wherein it extends substantially laterally outwardly of the automobile and an inner position wherein it is disposed within the automobile behind the driver's seat thereof, said support assembly comprising a plurality of elongated telescoping members, said telescoping members comprising an inner member mounted on the roof of the automobile, an intermediate member slidably mounted within said inner member, and an outer member slidably mounted within said intermediate member;

lifting means movably mounted on the outer end of said support assembly for engaging and lifting a wheelchair positioned adjacent the automobile near the driver's seat thereof when said support assembly is in said outer position;

actuating means connected to said support assembly and said lifting means for selectively moving said support assembly and said lifting means, said actuating means comprising a first reversible motor and a first rotatable drum operatively connected to said first motor, said first motor and said first drum being mounted on said inner member, and a first flexible cable connected to said first drum and to said outer member so that rotation of said first drum in one direction by said motor moves said outer member inwardly and rotation of said first drum in the opposite direction moves said outer member outwardly;

a support post mounted on the automobile roof near the outer portion thereof behind the driver's seat, said support post having a pulley rotatably mounted thereon, said first cable extending around said pulley and having its ends secured to said first drum, and said outer member being slidably supported on said support post; and

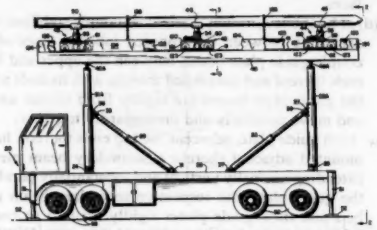
control means connected to said actuating means and being mounted on the automobile near the driver's seat thereof.

4,544,322

SHIPS PROPULSION SHAFT REMOVAL APPARATUS

Arthur J. Booker, Rte. 1, Box 73, Zuni, Va. 23848

Continuation-in-part of Ser. No. 300,591, Sep. 9, 1981, Pat. No. 4,400,133. This application May 9, 1983, Ser. No. 493,078
Int. Cl.⁴ B63B *3/00*
U.S. Cl. 414—589 **11 Claims**



1. An apparatus for removing or replacing a ships underwater propulsion shaft from a ship's hull in a dry dock and transporting it to or from the ship to a work area comprising:

(a) a mobile vehicular frame,

(b) spaced apart main cylinder ram lifts pivoted at their base to the vehicular frame, each lying beneath the shaft to be removed,

(c) a primary shaft support means mounted on the upper ends of said main cylinder ram lifts,

(d) at least a pair of secondary shaft alignment and positioning dolly support means carried by said primary shaft support means and being movable independently of each other along said primary shaft support means for successively maintaining said shaft in axial alignment during removal and replacement of said shaft from the hull to avoid binding of the shaft in the hull support,

(e) propulsion shaft receiving means mounted at the upper ends of said secondary shaft dolly support means,

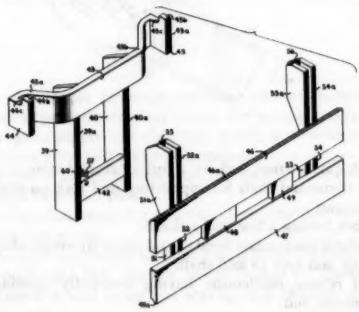
(f) variable shaft alignment positioning means between said receiving means and said secondary shaft dolly support means to maintain alignment of the propulsion shaft with the stern tube passing through the ships hull.

4,544,323

QUICK COUPLING AND LIFT DEVICE

James I. Malin, 3790 Woodman Dr., Troy, Mich. 48084

Filed Sep. 3, 1982, Ser. No. 414,643
Int. Cl.⁴ B66F *9/075*
U.S. Cl. 414—785 **68 Claims**



39. A quick lift couple and attachment comprising, in combination:

(1) a couple construction made up of:

(a) a pair of elongate, normally vertical couple guide plate beams,

(b) said couple guide plate beams opposed to one another in parallel, spaced apart relationship and being substantially rectangular in side, front and plan view,

(c) said beams having forward and rearward edges, top and bottom ends and inboard and outboard elongate flat faces,

(d) at least one normally horizontal couple stabilizer beam extending between the opposed inboard faces of said couple guide plate beams between the upper and lower ends thereof and connected thereto with its ends so that the guide plate beams are rigidly fixed to one another and move upwardly and downwardly together,

(e) each guide plate, adjacent the top ends thereof, having mounted adjacent thereto a secondary beam member extending normally vertical and substantially parallel to the guide plate, the respective secondary beam members and their guide plates rigidly secured to one another, with the forward edges of the secondary beam members in line with or positioned rearwardly of the guide plate beam front edges,

(2) an attachment for said couple made up of:

(a) a work piece member having a normally vertical rearward face of such width dimension as to extend between and across and be able to abut against the forward edges of said couple guide plates below the upper ends of said guide plates,

(b) two normally vertical work piece support plates fixed to the rearward face of said work piece member and extending normal thereto, and

(3) separate means cooperating between each of the secondary beam members and the upper portion of one of said support plates for removably engaging one with the other behind the forward edges of the couple guide plate beams and enabling raising and lowering the support plates and attach work piece when said guide plates are raised and lowered.

4,544,324

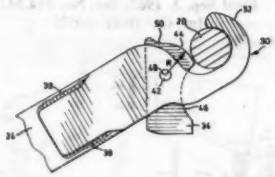
QUICKCHANGE FORK

Steve Hornung, Brampton, Canada, assignor to Kenhar Products Incorporated, Brampton, Canada

Filed Apr. 29, 1983, Ser. No. 490,051

Int. Cl.[4] B66F *9/12*

U.S. Cl. 414—785 **6 Claims**



1. A quickchange fork for a forklift truck having a substantially horizontal shaft for supporting said fork on said truck, comprising;

a fork having a tine and a shank,

a release mechanism fixed to said shank for removably securing said fork to said shaft,

said release mechanism having forwardly opening hook means, and

a lock member secured for pivotal movement with respect to said shank about a substantially horizontal axis between first and second positions with respect to said shank,

said lock member preventing disengagement of said hook means from said shaft when in said first position said lock member permitting disengagement of said hook means from said shaft when in said second position, and

said lock member is freely pivotal under the effect of gravity when said fork is rotated about said shaft, and wherein the center of gravity of said lock member is always below said horizontal axis so that said lock member rotates about said axis when said fork is rotated about said shaft.

4,544,325

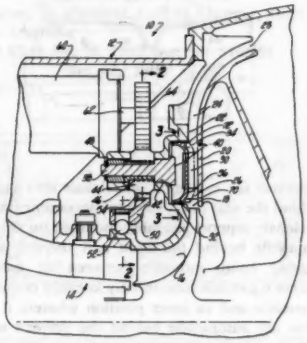
VARIABLE GEOMETRY DEVICE FOR TURBINE COMPRESSOR OUTLET

Casimir Rogo, Mt. Clemens, and Herman N. Lenz, Lambertville, both of Mich., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 22, 1980, Ser. No. 199,475

Int. Cl.[4] F01B *25/02*; F04D *15/00*

U.S. Cl. 415—150 **6 Claims**



1. A compressor assembly for a turbine engine comprising:

a support housing,

a compressor means contained within the support housing and having a compressed air outlet;

said support housing having a pair of spaced diffuser walls which form an annular diffuser passageway having its inner end open to said compressed air outlet,

said diffuser passageway having an annular recessed channel formed along one diffuser wall,

a ring mounted in said channel,

means for moving said ring transversely across said passageway between a retracted position in which said ring is nested within said channel and an extended position in which one side of said ring protrudes into and restricts said diffuser passageway,

a plurality of circumferentially spaced pins secured to and extending axially outwardly from the other side of said ring and through an opening in said channel, each pin having an external threaded portion along its length and wherein said moving means comprises a

plurality of internally threaded pinions, one pinion threadably engaging each pin,

means for restraining said pinions against axial movement,

a gear ring rotatably mounted to said housing coaxially with said ring, said gear ring being in mesh with said pinions,

a drive gear in mesh with one of said pinions, and

motor means for rotatably driving said drive gear.

4,544,326

VARIABLE-CAPACITY RADIAL TURBINE

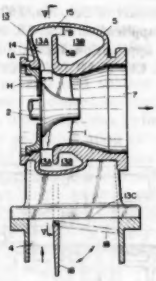
Fumio Nishiguchi, Yokohama, and Hiroshi Komatsu, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1983, Ser. No. 564,671

Claims priority, application Japan, Dec. 28, 1982, 57-227644; Dec. 29, 1982, 57-197687[U]; Dec. 29, 1982, 57-233853; Jul. 14, 1983, 58-126993; Sep. 6, 1983, 58-162495

Int. Cl.⁴ F04D *29/44, 27/00*

U.S. Cl. 415—151 **25 Claims**



1. A variable-capacity radial turbine, comprising:

a turbine wheel,

a turbine housing enclosing said turbine wheel, said turbine housing having an inlet port for receiving a fluid, a scroll passage for directing the stream of the fluid from said inlet port to said turbine wheel, a turbine wheel chamber containing said turbine wheel, and an outlet passage for discharging the fluid from said wheel chamber, said scroll passage being divided into a first scroll passage and a second scroll passage by a partition wall extending longitudinally in the scroll passage so as to form two parallel flow paths, said first scroll passage being formed with a side aperture through which the fluid in said first passage is allowed to flow toward the outer periphery of said turbine wheel, said partition wall being formed with an opening through which the fluid is allowed to flow between said first and second passages, said opening extending longitudinally of said scroll passage, wherein said second scroll passage is isolated from said wheel chamber by said partition wall so that the fluid in said second passage can flow into the turbine wheel chamber only through said opening and said side aperture, and

valve means for opening and closing said second passage.

4,544,327

CERAMIC ROTOR AND MANUFACTURING PROCESS THEREFOR

Kiminari Kato, Konan, Japan, assignor to NGK Insulators, Ltd., Japan

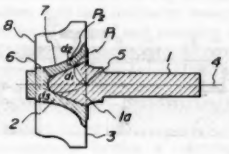
Division of Ser. No. 260,749, May 5, 1981, Pat. No. 4,460,527. This application Apr. 25, 1984, Ser. No. 603,702

Claims priority, application Japan, Nov. 20, 1980, 55-161706

Int. Cl.⁴ F01D *5/04*

U.S. Cl. 416—241 B **8 Claims**

1. A ceramic rotor of a unitary structure, comprising integrally formed blade portions which include a completely smooth conical female surface, said blade portions comprising ceramics sintered at atmospheric pressure, a blade-holding portion which includes a completely smooth conical male surface, said blade-holding portion comprising ceramics sintered at atmospheric pressure, said blade-holding portion having a density which is greater than that of said blade portions, and a cement portion between said smooth conical female surface and said smooth conical male surface, said cement portion for fixing said blade portions to said blade-holding portion, said blade portions having front surfaces defining a first plane and rear surfaces defining a second plane, said second plane intersecting a central axis of said blade-holding portion at a first point and being spaced from said first plane by a distance d_3 along said central axis, said blade portions having interblade center lines defining a curved surface surrounding



said central axis, said cemented surface being located between said curved surface and said central axis in a relationship such that a distance d_1 from an arbitrary point on said cemented surface to said first point along a straight line therebetween is less than said distance d_3 but not less than a distance d_2, said distance d_2 being measured from said arbitrary point on said cemented surface to said curved surface taken along said straight line, specifically, $d_1 < d_3$ and $d_1 \geqq d_2$.

4,544,328

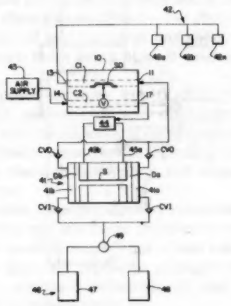
SOLD-OUT DEVICE FOR SYRUP PUMP

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 5, 1982, Ser. No. 432,840

Int. Cl.⁴ F04B *49/00, 11/00;* **B67D** *5/08*

U.S. Cl. 417—33 **7 Claims**



1. In a post-mix beverage dispenser system including a pneumatically-driven demand pump for pumping syrup between a syrup supply to a dispenser nozzle, a flow-regulating control device for said pump comprising:

first conduit means for accommodating the flow of syrup output from said pump;

second conduit means for accommodating the flow of gas to drive said pump;

surge-suppressor means for suppressing surges of syrup flow through said first conduit means caused by changes in pressure of said syrup and sensing said changes in pressure; and

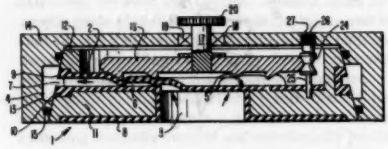
valve means for shutting off the flow of gas through said second conduit means when the pressure of said syrup sensed by said surge-suppressor means falls below a predetermined value.

4,544,329

PERISTALTIC PUMP HAVING A SPIRAL CAM AND STRAIGHT PERISTALTIC TUBE

Matthew O'Boyle, Somers, Conn., assignor to Windsor Medical, Inc., Enfield, Conn.

Filed Jan. 14, 1983, Ser. No. 458,060
Int. Cl.[4] F04B *43/12, 45/08*
U.S. Cl. 417—53 **22 Claims**



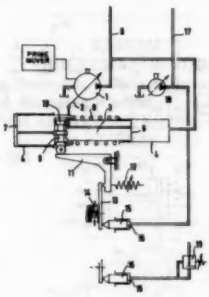
1. A peristaltic pump comprising at least one peristaltic tube means defining a lumen extending from a suction end to a discharge end of said tube means, and an at least essentially planar, spiral cam engaging said tube means and closing said lumen, at least one of said spiral cam and said tube means being rotatable relative to the other to effect pumping.

4,544,330

CONTROL APPARATUS FOR SEVERAL DRIVE ASSEMBLIES CONSISTING OF HYDROSTATIC DRIVE UNITS

Reinhold Schniederjan, Neu-Ulm, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,502
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323278
Int. Cl.[4] F04B *1/06*
U.S. Cl. 417—218 **5 Claims**



1. A control apparatus for a plurality of drive assemblies including hydrostatic drive units comprising:

one or more first hydraulic pumps each having a total output control device and a capacity adjusting device;

an output-preferred hydraulic pump having an adjustable output control device and a capacity adjusting device;

a prime mover for driving said first output-preferred hydraulic pumps;

said adjustable output control device including an adjusting piston connected to the capacity adjusting device of said one or more first hydraulic pumps, and a spool valve for controlling the pressure action of said adjusting piston on one side of said adjusting piston, said spool valve being connected on one side to a pressure line from said one or more first hydraulic pumps and said spool valve being acted upon on an opposing side by an adjustable spring;

a first lever acting upon said adjustable spring, said first lever being supported by an adjustable fulcrum support means forming first and second lever arms, the length of said arms being adjustable; and

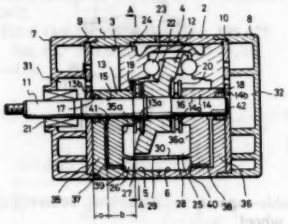
a measuring piston which presses against said first lever to counteract the force of said adjustable spring acting upon the spool valve, said measuring piston being connected to a pressure line from said output-preferred hydraulic pump for controlling the action of the measuring pump.

4,544,331

SWASH-PLATE TYPE COMPRESSOR

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 160,597, Jun. 18, 1980, abandoned. This application Dec. 15, 1982, Ser. No. 450,081
Claims priority, application Japan, Jun. 29, 1979, 54-82391
Int. Cl.[4] F04B *1/16;* F01M *9/00*
U.S. Cl. 417—269 **6 Claims**



1. In a swash-plate type compressor having a pair of cylinder blocks combined together in axial alignment and having axes thereof disposed horizontally, each including a plurality of cylinder bores and a boss portion formed therein with a through bore extending axially thereof, said boss portions of said cylinder blocks having inner end faces disposed opposite and spaced from each other; a plurality of pistons slidably received within said clyinder bores; a drive shaft rotatably inserted in said axial through bores; a swash plate secured on said drive shaft in slidable engagement with said pistons; a pair of valve plates arranged at opposite ends of said combined cylinder blocks; a pair of cylinder heads secured to the opposite ends of said combined cylinder blocks, said cylinder heads having suction chambers; said valve plates each having a through bore directly communicating an associated one of said axial through bores in said cylinder blocks with an associated one of said suction chambers; said boss portions of said cylinder blocks each having an outer end face disposed substantially in contact with an associated one of said valve plates; a pair of plain radial bearings mounted within said axial through bores and supporting said drive shaft radially thereof; a pair of thrust bearings interposed between said boss portions and said swash plate and supporting said swash plate axially thereof; adjacent lower ones of said cylinder bores defining therebetween a swash plate chamber and an oil reservoir located beneath said swash plate chamber and communicating therewith, said swash plate chamber communicating with all said cylinder bores;

the improvement which comprises:

a pair of wall portions, each having a substantial thickness and extending from said boss portions to bottom portions of said cylinder blocks, said wall portions defining therebetween said swash plate chamber and said oil reservoir; and

a pair of lubricating oil channels formed within said wall portions, said lubricating oil channels each having one end opening in said oil reservoir and the other end opening in a peripheral inner wall of an associated one of said axial through bores at such a predetermined axial location between an associated one of said radial bear-

ings and an associated one of said thrust bearings as permits supply of suitable amounts of lubricating oil from said other end of each of said lubricating oil channels to both said associated radial bearing and said associated thrust bearing, said other ends of said lubricating oil channels each having an opening having a diameter larger than that of the remaining portion thereof;

whereby rotation of said swash plate causes lubricant oil in said oil reservoir to be guided through said lubricating oil channels such that part of said lubricant oil is fed in a liquid state to said thrust bearings through gaps between said drive shaft and said axial through bores in said cylinder blocks due to centrifugal force produced by rotation of said thrust bearings, and such that the other part of said lubricant oil is fed in a liquid state to said radial bearings due to a pressure difference between said oil reservoir and said suction chambers, which pressure difference is caused by reciprocating motions of said pistons within respective cylinder bores thereof;

said other ends of said lubricating oil channels being located at locations where the distance ratio of a to b is 1 to 2 at maximum, wherein a represents the distance between the diametrical center of said other end of said lubricating oil channel and said outer end face of an associated one of said boss portions of said cylinder blocks, and b represents the distance between the diametrical center of said other end of said lubricating oil channel and said inner end face of said associated boss portion.

4,544,332

DOUBLE ACTING TYPE COMPRESSOR

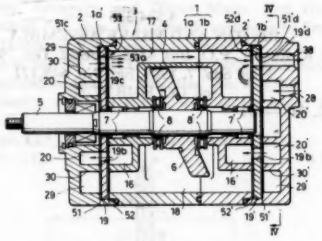
Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,137

Claims priority, application Japan, Aug. 12, 1982, 57-122593[U]

Int. Cl.⁴ F04B *39/00, 1/16, 1/18*

U.S. Cl. 417—269 **5 Claims**



1. A double acting type compressor comprising:

a main body including a cylinder block having at least one cylinder bore axially extending therethrough and a pair of cylinder heads secured to opposite ends of said cylinder block;

at least one double headed piston received within said at least one cylinder bore for reciprocating motion therein;

a pair of suction chambers formed in said main body at opposite ends thereof, at least one of said suction chambers being disposed to be supplied with compression medium from outside;

a suction passageway formed in said main body and communicating said suction chambers with each other;

a pair of discharge chambers formed in said main body at said opposite ends thereof;

a discharge passageway formed in said main body and communicating said discharge chambers with each other;

a discharge port formed in said main body for allowing said compression medium to be discharged to the outside therethrough, said discharge port extending through one of said discharge chambers;

communication means communicating said discharge port substantially directly with said discharge passageway;

a pair of pulsation attenuating means interposed between said discharge chambers and said discharge passageway, each of said pulsation attenuating means having a multiplicity of small through holes formed therein, said small through holes communicating a corresponding one of said discharge chambers with said discharge passageway, said small through holes of each of said pulsation attenuating means having a substantially reduced total cross-sectional area relative to the cross-sectional area of said corresponding one of said discharge chambers so as to impart increased flow resistance to said compression medium passing said small through holes;

said discharge passageway having a substantially large cross-sectional area relative to the total cross-sectional area of said small through holes of each of said pulsation attenuating means;

said discharge port communicating with each of said discharge chambers solely through said communication means, said discharge passageway and a corresponding one of said pulsation attenuating means;

a pair of valve plates interposed between said cylinder heads and said cylinder block, each of said valve plates having a discharge through hole formed therein, said discharge through hole of each of said valve plates communicating a corresponding one of said discharge chambers formed within said cylinder heads with said discharge passageway axially extending through said cylinder block;

a pair of valve sheets interposed between said cylinder block and said valve plates, said small through holes of said pulsation attenuating means being formed in each of said valve sheets at a location facing said discharge through hole formed in a corresponding one of said valve plates;

said communication means comprising a first through hole formed through one of said valve plates corresponding to said one of said discharge chambers and a second through hole formed through one of said valve sheets corresponding to said one of said discharge chambers, said first and second through holes being aligned with said discharge port; and

a gasket interposed between one of said cylinder heads within which said one of said discharge chambers is formed and said corresponding one of said valve plates;

said communication means further including a third through hole formed through said gasket and aligned with said discharge port;

whereby the total quantity of said compression medium discharged into said discharge chambers is caused to flow through said small through holes of said pulsation attenuating means into said discharge passageway, to thereby substantially attenuate pulsations of said compression medium and to reduce noise

---

4,544,333

CAPABILITY CONTROL APPARATUS FOR A COMPRESSOR

Takahisa Hirano, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 303,568, Sep. 18, 1981, abandoned. This application Jul. 25, 1984, Ser. No. 635,463

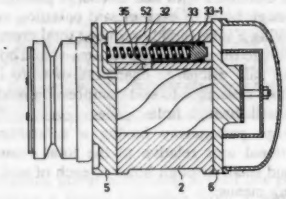
Claims priority, application Japan, Sep. 19, 1980, 55-129196; Mar. 30, 1981, 56-45600

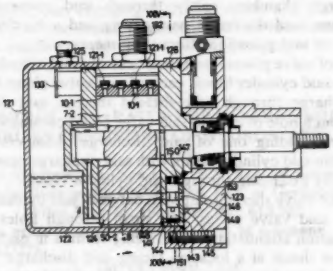
Int. Cl.⁴ F04B *49/00*

U.S. Cl. 417—299 **2 Claims**

1. A capability control apparatus for a compressor including a compressor chamber, comprising means for forming a suction effect region separate from said compressor chamber, a bypass hole for providing communication between said compressor chamber and said suction effect region, said bypass

hole having a first end opening to said compressor chamber and a second end opening to said suction effect region, and an unloader piston arranged in said suction effect region and being movably displaceable relative to the second end of said bypass hole for opening and closing said bypass hole, said unloader piston having first surfaces and separate oppositely directed second surfaces thereon and in said suction effect region the first surfaces being acted upon by the in-cylinder





pressure of said compressor chamber and a suction opening arranged in said suction effect region so that the absolute pressure acting through said suction opening acts on said second surfaces, and said unloader piston arranged to open the second end of said bypass hole when the absolute pressure acting through the suction opening acts on said second surfaces rises above a predetermined value and to close the second end of said by-pass hole when the absolute pressure acting through the suction opening drops below the predetermined value.

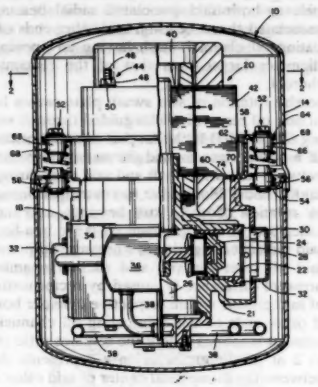
4,544,334

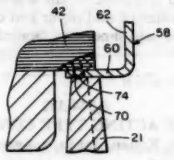
MECHANICAL MEANS FOR HOLDING AIR GAPS ON BOLT-DOWN STATORS IN REFRIGERANT COMPRESSORS

Charles B. Ellis, Fort Worth, Tex., assignor to Lennox Industries, Inc., Ft. Worth, Tex.

Filed Feb. 29, 1984, Ser. No. 584,762
Int. Cl.[4] F04B *35/04*; H02K *15/14*
U.S. Cl. 417—360 **9 Claims**

1. In a refrigerant compressor including compression mechanism comprising a body, cylinder means within said body, piston means movable within said cylinder means, and a drive shaft for driving said piston means and motor means for actuating said drive shaft including rotor means and stator means, there being an air gap between the stator means and the rotor means, said rotor means being operatively connected to said drive shaft, the improvement comprising means for maintaining the air gap between the rotor means and the stator means disposed between the stator means and the body for the compression mechanism, said maintaining means including a plural-





ity of spherical members indented into and secured between the stator means and the body for the compression mechanism.

4,544,335

PISTON AND VALVE ASSEMBLY

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Sep. 7, 1984, Ser. No. 648,121
Int. Cl.[4] F04B *47/08*
U.S. Cl. 417—401 **15 Claims**

1. A hydraulically actuated pump assembly for producing fluid from a formation located downhole in a borehole, said

pump assembly has a main body, a power piston, a pump plunger affixed to said power piston;

means forming said main body into a power chamber and a production chamber; said power piston and pump plunger, respectively, are reciprocatingly arranged in slidable sealed relationship within said power chamber and production chamber, respectively; said power piston divides said power chamber into upper and lower power chambers;

a stationary control rod axially aligned respective to the piston and plunger, a valve means including a valve control sleeve, means by which said sleeve is reciprocatingly received within said piston and concentrically arranged respective to said control rod;

means on said control rod for causing said sleeve to reciprocate within said piston between a first and a second alternant position of travel in response to reciprocation of the power piston; means by which said sleeve, when moved to the first alternate position, forms a flow passageway extending through the control rod, through the valve means, and into the lower chamber, thereby causing the power piston to stroke in one direction;

means on said control rod for causing said sleeve to be moved to the second alternate position, and thereby form a flow passageway extending from said lower power chamber, through said valve means and out of said main body in response to said piston having reciprocated in the recited one direction;

a formation fluid inlet, a production valve means, a produced fluid outlet, and passageway means by which fluid flows through said production valve means into the production chamber and out of said main body;

whereby said sleeve is shifted into the first alternant position when said piston upstrokes, and said sleeve is shifted into the second alternant position when said piston downstrokes, and power fluid is thereby applied to said piston to cause the piston and plunger to upstroke, and thereafter, the spent power fluid is exhausted from the pump assembly on the piston downstroke.

4,544,336

MEDICAL PERISTALTIC PUMP

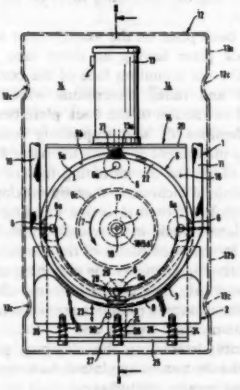
Ulrich Faeser, Kronberg, and Dieter Mahn, Bad Homburg v.d.H., both of Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homberg, Fed. Rep. of Germany

Continuation of Ser. No. 365,325, Apr. 5, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 625,585

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114127

Int. Cl.⁴ F04B *35/04, 43/12;* **A61M** *5/00*

U.S. Cl. 417—412 **5 Claims**



1. In a peristaltic pump for medical purposes having a peristaltic flexible pipe element, a part-circular backup wall having an inwardly curved face for supporting said pipe element, a wheel with rollers for rolling said pipe elements and nipping it against said wall at a point moving along side pipe element giving a peristaltic pumping effect, and an electric motor for driving said wheel, characterized in that the wheel has an axis of turning normal to the axis of turning of said electric motor, the wheel has a gear teeth at an outer edge thereof, the electric motor has a pinion for driving said teeth with a step-down ratio of more than 1:100, the wheel has a stub shaft, there is an U-like part with a middle part in which said stub shaft is journalled, there is a wing on said U-like part supporting said electric motor, said pinion is on an inner side of said wing and there is a second wing at an opposite end of said U-like part for supporting said backup wall movingly thereon.

4,544,337

ROTARY COMPRESSOR WITH TWO OR MORE SUCTION PARTS

Teruo Maruyama, 18-40, Nagisaminamimachi, Hirakata-shi, Osaka 573, Japan

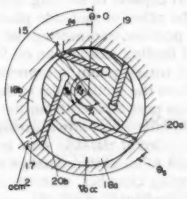
PCT No. PCT/JP82/00436, § 371 Date Jul. 11, 1983, § 102(e) Date Jul. 11, 1983, PCT Pub. No. WO83/01818, PCT Pub. Date May 26, 1983

PCT Filed Nov. 10, 1982, Ser. No. 522,366

Claims priority, application Japan, Nov. 11, 1981, 56-180814; Feb. 24, 1982, 57-29719

Int. Cl.⁴ F04C *18/00, 29/08*

U.S. Cl. 418—15 **5 Claims**



1. A vane type rotary compressor comprising:

a cylinder casing constituted by a cylinder having a hollow interior and side plates closing the ends of said cylinder to define a rotor chamber in said hollow interior;

a rotor rotatably mounted in said rotor chamber eccentrically of the axis thereof;

a plurality of vanes slidably mounted on said rotor for sliding outwardly of said rotor into sliding engagement with the interior of said hollow interior during rotation of said rotor and defining vane chambers between said vanes, said rotor and said cylinder which increase and then decrease in size during rotation of said rotor;

said casing having at least two suction ports therein opening into said vane chambers, said ports being spaced around said hollow interior in the direction of rotation of said rotor substantially equally to the circumferential spacing of said adjacent vanes;

said compressor having the parameter K2 with the value $0.025 < K2 < 0.080$, wherein:

$K2 = a\theta_s / V_o$

a=effective flow area of the suction port toward the compression direction

θ_s=the angle through which the end of a vane has rotated from the top of said casing to the end of a suction stroke

V_o=maximum volume of a vane chamber.

4,544,338

OIL FEEDER MEANS FOR USE IN A HORIZONTAL TYPE ROTARY COMPRESSOR

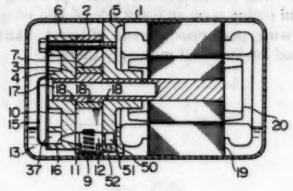
Masahiro Takebayashi; Akio Sakazume, both of Yokohama; Hiroshi Iwata, Odawara; Masahiko Sugiyama, Tochigi; Mitsuru Murata, Tochigi, and Shigetaro Tagawa, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,440

Claims priority, application Japan, May 27, 1983, 58-92286

Int. Cl.[4] F04C *18/00, 29/02;* **F04B** *39/02*

U.S. Cl. 418—63 **5 Claims**



1. In a horizontal type rotary compressor constructed such that a compression element is provided within a case which includes a cylinder, a shaft having a crank thereon, a pair of side plates concurrently serving both as bearings of said shaft and as side walls of said cylinder, a roller fitted onto said crank, and a vane so arranged so as to slide in a groove of said cylinder and to have a tip end thereof contacted with said roller rotating in accordance with the rotation of said crank and an opposite end thereof pushed by a spring to make a reciprocating movement along said groove; a pumping chamber is defined by a rearface of said vane, said groove of said cylinder and said side plates; one of said side plates is formed therein with a suction port capable of sucking thereinto the oil within said case while the other of said side plates is formed therein with a discharge port for transmitting the oil in said pumping chamber to an oil feeding passage, an oil feeder means for use in said horizontal rotary pump compressor characterized in that a flow path from the suction inlet to the pumping chamber comprises a suction port tapered from the inlet thereof to the outlet thereof, said inlet being downwardly opened into an oil sump, a space provided at the side plate in which said suction port is opened, and a horizontal passage communicating said space to said pumping chamber, whereby said flow path has a resistance against the backflow of oil.

4,544,339

APPARATUS FOR VULCANIZATION OF RUBBER BY DIELECTRIC HEATING

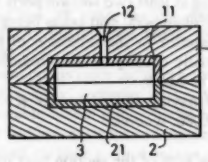
Masaru Itoh, Komaki, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Division of Ser. No. 456,430, Jan. 7, 1983, Pat. No. 4,481,159. This application Aug. 31, 1984, Ser. No. 646,164

Claims priority, application Japan, Jan. 30, 1982, 57-7355

Int. Cl.[4] B29H *5/26*

U.S. Cl. 425—174.8 R **1 Claim**



1. A mold useful in a high frequency electrical energy field, comprising:

means providing an inner surface portion forming a cavity, said inner surface portion being made of a dielectric material having a relatively high dielectric loss factor; and

means providing an outer surface portion formed integrally on said inner surface portion, said outer surface portion being made of a dielectric material having a relatively lower dielectric loss factor.

4,544,340

ATTACHMENT MECHANISM FOR INTERCHANGEABLE INJECTION MOLDING DIES

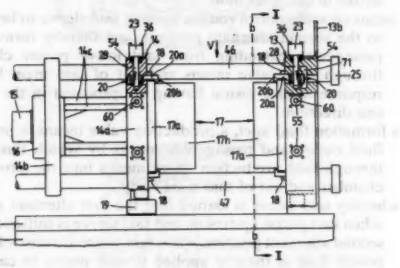
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 449,550, Dec. 13, 1982, Pat. No. 4,473,346. This application Jul. 31, 1984, Ser. No. 636,325

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327806

Int. Cl.[4] B29F *1/022*

U.S. Cl. 425—183 **20 Claims**



1. A mechanism for the clamping attachment of interchangeable injection molding dies to the die carrier plates of an injection molding machine, which machine has a die closing unit defining a horizontal center axis and including a stationary and a movable die carrier plate with radially oriented parallel opposite die mounting faces for the attachment thereto of a stationary and a movable die half, the movable die carrier plate being guided on a plurality of horizontal tie rods and driven for opening and closing movements along said center axis, the die attachment mechanism comprising in combination:

at least two axially movable clamping plungers arranged in each die carrier plate in axial guide bores which are located on opposite sides of the center axis of the die closing unit, the clamping plungers having forward extremities protruding a distance from the die mounting faces of the associated die carrier plates;

a standardized back plate on the axially outer side of each die half, the back plate having an outer face adapted to be clamped to the die mounting face of the corresponding die carrier plate and radial dimensions which permit radial insertion and retraction of the back plate between the protruding extremities of said oppositely located clamping plungers, in a movement in which the outer face of the back plate moves along the die mounting face of the die carrier plate with minimal clearance, thereby making it possible to insert and attach a closed injection molding die, while the die carrier plates remain in a virtually closed position;

means defined by the back plates of the die halves and by the associated clamping plungers for clamping each back plate to the die mounting face of the corresponding die carrier plate, when the clamping plungers are retracted in the direction of the die mounting plate; and

means for forcibly retracting the clamping plungers in the direction of the die mounting plate so as to operate said back plate clamping means; and wherein

the plunger retracting means includes a transverse bore in each clamping plunger and a wedge rod extending transversely to

the clamping plunger so as to reach through its transverse bore;

the transverse bore of the clamping plunger defines an axially forwardly facing tapered face and an opposite, axially rearwardly facing extension drive taper;

the wedge rod portion reaching through the transverse bore of the clamping plunger has an axially rearwardly facing tapered face which is inclined to the axis of the wedge rod and cooperates with the tapered face of the transverse bore to translate an axial displacement of the wedge rod into a much smaller retracting displacement of the clamping plunger, while applying to said clamping plunger a retraction force which is correspondingly greater than the axial force applied to the wedge rod; and

the wedge rod portion reaching through the transverse bore of the clamping plunger further includes an axially forwardly facing drive protrusion which cooperates with the extension drive taper of the transverse bore to forcibly translate an opposite axial displacement of the wedge rod into a corresponding extension displacement of the clamping plunger.

4,544,341

WORKPIECE HAVING WEAR-RESISTANT INSERTS LOCKED IN RECESSES IN THE WORKPIECE

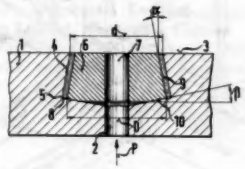
Gerhard Gnadig, Ditzingen, and Siegfried Kuklinski, Stuttgart, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Aug. 10, 1984, Ser. No. 639,912

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330137

Int. Cl.⁴ B29C *1/00*

U.S. Cl. 425—192 R **15 Claims**



1. A wear-protected metal workpiece comprising a metal plate having a work surface, said plate having a recess therein extending from said work surface into said plate, a shaped member of wear-resistant material inserted into said recess and having an outer surface which is substantially flush with the work surface of the plate, said plate having a wall bounding said recess which at least at two opposed locations widens inwardly into said plate in a direction away from said work surface, said shaped member having an outer wall which at least at two opposed locations widens in the direction of insertion thereof into said recess, the walls of the recess and of the shaped member defining a space therebetween at said respective opposed locations, said recess having an opening at the work surface of said plate of an extent to freely receive the shaped member which has a maximum extent at said two locations which is less than the extent of said opening of said recess, and binder means filling said space for locking said shaped member in said recess.

4,544,342

DEVICE FOR THE MANUFACTURE OF PRESSED PROFILED BODIES

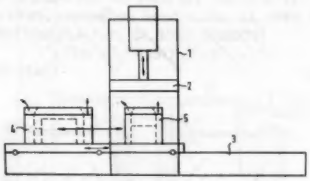
Jakob F. Werz, and Edmünd Münk, both of Oberstenfeld, Fed. Rep. of Germany, assignors to Werzalit-Werke J. F. Werz KG, Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,487

Claims priority, application European Pat. Off., Jul. 9, 1983, 83106759

Int. Cl.⁴ B29J *5/08;* B30B *1/32*

U.S. Cl. 425—193 **5 Claims**



1. A device for the manufacture of pressed profiled bodies from a non ascending mixture, comprising:

a raisable and depressable heated pressing tool upper part formed as a flat plate;

at least one pressing tool lowerpart disposed for lateral movement below said pressing tool upper part and having a cavity for containing the mixture to be pressed, and a reversible raisable and depressible frame surrounding said cavity and having a side facing said pressing tool upperpart, said frame including a frame part disposed on said side of said frame and movable sideways relative to said frame.

4,544,343

APPARATUS FOR PRODUCING POLYACETYLENE FILM

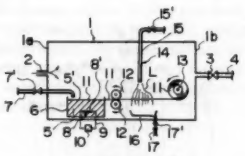
Ichiro Hide, Sapporo, Japan, assignor to Hoxan Corporation, Sapporo, Japan

Filed Sep. 11, 1984, Ser. No. 649,507

Claims priority, application Japan, Sep. 12, 1983, 58-141185[U]

Int. Cl.⁴ B29C *25/00;* B01J *12/02*

U.S. Cl. 425—224 **3 Claims**



1. An apparatus for producing a polyacetylene film by polymerizing acetylene gas in contact with Ziegler-Natta catalyst comprising: in a vessel to be introduced with acetylene gas

a film producing container for storing Ziegler-Natta catalyst,

a pair of feed rollers provided adjacently to draw out the polyacetylene film polymerized on the surface 5' of the catalyst and reversely driven in roll contact with each other,

a cleaning member for cleaning the drawn polyacetylene film, and

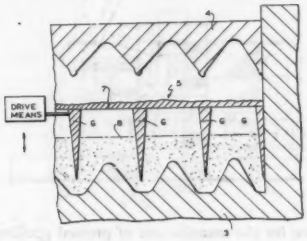
a winding unit for winding the polyacetylene film.

4,544,344

ARRANGEMENT FOR PRODUCING SHAPED PARTS

Edmund Munk, Oberstenfeld, Fed. Rep. of Germany, assignor to Werzalit-Werke, J.F.Werz KG, Ludwigsburg, Fed. Rep. of Germany

Filed Jan. 26, 1984, Ser. No. 573,561
Claims priority, application European Pat. Off., Feb. 5, 1983, 83101104.4
Int. Cl.[4] B29C *17/00*
U.S. Cl. 425—324.1 10 Claims



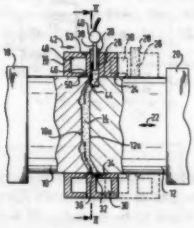
1. An arrangement for producing shaped parts from a non-swelling mixture of fibers and a heat-hardenable synthetic resin, comprising a lower pressing tool and an upper pressing tool movable away from each other to a filling position, in which they are spaced from one another and in which a space between the upper and the lower tool is filled with said mixture, and towards each other to a pressing position in which said mixture is pressed between said upper and lower tool; and a pressing mass divider introducible into said space between said upper pressing tool and said lower pressing tool when the latter are in said filling position and removable from said space after filling of said mixture into said space and before said lower pressing tool and said upper pressing tool are moved to said pressing position.

4,544,345

DEVICE FOR THE PRODUCTION OF MOLDED ARTICLES FROM A POURABLE SUBSTANCE

Eugen Bühler, Burtenbach; Klaus Strobel, Selb, and Karl Schwarzmeier, Selb-Oberweissenbach NR. 89, all of Fed. Rep. of Germany, assignors to Eugen Bühler, Burtenbach and Hutschenreuther AG, Selb, both of, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,354
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1981, 3144678
Int. Cl.[4] B28B *3/08*
U.S. Cl. 425—405 R 8 Claims



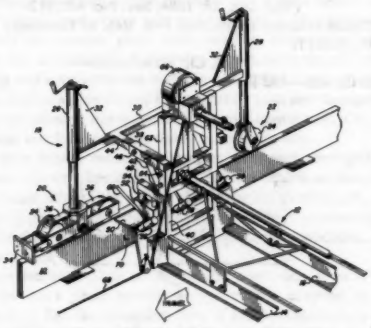
1. Device, for producing molded articles from a pourable substance, such as an oxide ceramic substance or a porcelain substance, comprising a pair of pressing mold parts disposed in facing relation and movable in the horizontal direction, each of said mold parts having an outer cylindrically shaped circumferential periphery, said mold parts being relatively movable between an open position and a closed position, in the closed position said mold parts are disposed in spaced relation forming a mold space therebetween with a laterally open gap between the outer circumferential peripheries of said mold parts and extending around the outer circumferential periphery of the mold space, an annular closure member having an inner cylindrical surface encircling the outer circumferential peripheries of said mold parts and forming a closure for the gap extending around the mold space, said closure member having a filling passage extending through said inner cylindrical surface and opening through said gap into said mold space, means forming a vacuum system openable through the gap into said mold space for establishing a vacuum within said mold space, and said closure member having an opening in the inner surface thereof connecting the vacuum system through said gap to said mold space, said opening extending in the circumferential direction around at least a major part of the circumference of said inner cylindrical surface of said closure member exclusive of the location of said filling passage, and said closure member is displaceable in the horizontal direction relative to the outer circumferential periphery of said mold parts from a filling position in which both said filling passage and said opening are in alignment with said gap opening into said mold space to a pressing position in which both said filling passage and said opening are disposed out of alignment with said gap opening into said mold space.

4,544,346

CONCRETE SCREED WITH CURB FORMING APPARATUS

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation-in-part of Ser. No. 457,727, Jan. 13, 1983, Pat. No. 4,466,757. This application Feb. 17, 1984, Ser. No. 581,379
Int. Cl.[4] E01C *19/38*
U.S. Cl. 425—456 9 Claims



1. Apparatus for simultaneously finishing the surface of an area of plastic concrete and forming a curb along a side of said area as said apparatus is translated along the length of said area, the edge of said area being defined by a concrete form including a linear upper surface and a vertically oriented, planar inner surface, said apparatus comprising:

a. a triangular truss screed having an end and including spaced apart substantially linear front and rear screed blades terminating at the end of said screed and forming the base of said truss, said screed further including a horizontally oriented structural member forming the apex of said truss and vibration generating means for transmitting vibrations to said front and rear screed blades;

c. means for translating said apparatus along said concrete form; '

d. a curb form fabricated from a continuous sheet of substantially rigid material including an upper finishing surface

having a first linear edge and an interior finishing surface having a second linear edge;

e. screed support means coupled to the first and second struts of said end handle for maintaining the end of said screed inboard of said concrete form and for supporting said front and rear screed blades at a level below the upper surface of said concrete form to thereby create an unobstructed curb forming gap extending laterally between the end of said screed and the inner surface of said concrete form and extending vertically from the lower surface of said front and rear screed blades to a height above the upper surface of said concrete form, said screed support means including

i. a first roller unit for engaging the upper surface of said concrete form and enabling said screed support means to be translated along said form;

ii. bracket means coupled to said first roller unit at an elevation above the upper surface of said concrete form and having first clamping means for engaging the first and second struts of said end handle to secure said screed support means to said end handle at a selected elevation to control the height differential between the upper surface of said concrete form and said front and rear screed blades;

f. a curb form support bracket coupled to said end handle at an elevation above the upper surface of said concrete form and extending into the curb forming gap toward the inner surface of said concrete form; and

g. vibration isolation means coupled to said curb form support bracket and to the upper surface of said curb form for securing said curb form to said curb form support bracket within the curb forming gap, for maintaining the first linear edge of said curb form parallel to the inner surface of said concrete form, and for attenuating the transmission of vibration from said screed to said curb form;

Wherein said first clamping means is secured to said end handle at an elevation which aligns the first linear edge of said curb form in substantially abutting contact with the inner surface of said concrete form to create a closed curb forming chamber between said curb form and said concrete form at a location outboard of said screed end handle.

4,544,347

ARTIFICIAL FUEL-EFFECT GAS FIRES

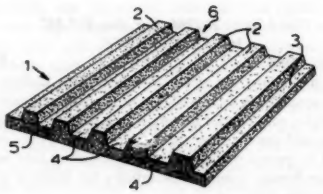
Eric D. Herbert, Warrington, England, assignor to Tennant Radiant Heat Limited, Warrington, England

Filed Jul. 5, 1984, Ser. No. 627,689

Claims priority, application United Kingdom, Jul. 7, 1983, 8318413

Int. Cl.⁴ B32B *3/30*

U.S. Cl. 431—125 **20 Claims**



1. A radiant fuel support for an artificial fuel-effect gas fire and in the form of a plaque of refractory material having an upper surface and a lower surface, the upper surface being formed with a series of ridges with closed-bottom channels therebetween, the ridges being designed to support artificial fuel elements placed thereon so as to bridge the channels and the channels being open-ended at least at one end and designed to receive gas flames playing directly onto the upper surface thereof at a shallow glancing angle thereto, said plaque being devoid of flame or fuel passages extending therethrough between its upper and lower surfaces.

4,544,348

APPARATUS FOR BURNING SPIRIT OR THE LIKE LIQUID FUEL

Karl O. A. Boij, Verkstadsgatan 8, S-573 01 Tranas, Sweden

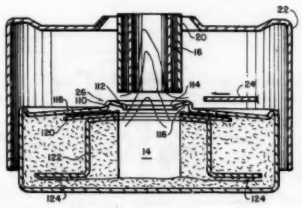
PCT No. PCT/SE81/00212, § 371 Date Mar. 8, 1982, § 102(e) Date Mar. 8, 1982, PCT Pub. No. WO82/00332, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 10, 1981, Ser. No. 359,721

Claims priority, application Sweden, Jul. 11, 1980, 8005113; Jul. 11, 1980, 8005114; Nov. 28, 1980, 8008373

Int. Cl.⁴ F23Q *25/00*

U.S. Cl. 431—146 **11 Claims**



1. Apparatus for burning spirit or similar liquid fuel including a container filled with a fuel absorbing mass with a partly exposed surface from which fuel to be burned evaporates and along which combustion takes place, a draft or burner tube positioned and arranged with respect to the exposed surface to provide suction of combustion air into the tube, the fuel container being separate and removable from the rest of the apparatus and having top, bottom, and side walls enclosing the absorbing means, the top wall including a single opening which is centrally located for exposing the partly exposed surface of the fuel absorbing mass, the area of said central opening comprising a minor portion of the total area of the top wall, means operable to position said burner tube above the edge of said opening, a substantially flat control and extinguishing disk arranged to be moved to partially or completely cover said central opening when said burner tube is positioned above the edge of said opening to control or extinguish the burning of the fuel, the edge of said opening consisting of a rim portion of the top wall substantially raised above the rest of the top side of the container and having an annular upper surface against which the control and extinguishing disk is movable into contact and a lower annular surface spaced above the remainder of the lower surface of the top wall, the side and upper walls of said rim portion including said annular upper surface being imperforate, the upper surface of said fuel absorbing mass being spaced beneath said raised rim portion to define an open space beneath said rim portion and extending radially inwardly therefrom.

4,544,349

OIL BURNER COMPRISING SAFEGUARD MECHANISM AGAINST POWER STOPPAGE

Kazuharu Nakamura, and Motoki Matsumoto, both of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Oct. 15, 1982, Ser. No. 434,449

Claims priority, application Japan, Oct. 16, 1981, 56-166251

Int. Cl.⁴ F23D *5/02*

U.S. Cl. 431—258 **10 Claims**

1. A liquid fuel burner having a safeguard feature against interruption of electric power, said burner comprising:

an air supply pipe;

a liquid fuel supply pipe;

vaporization and ignition means connected to said air and fuel supply pipes for forming and igniting a combustible gas from air and liquid fuel supplied through said pipes;

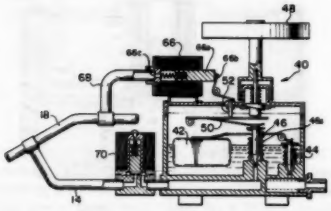
circuit means for connecting said burner to a supply of electric current;

means for changing the flow rate of fuel through said fuel supply pipe to achieve different rates of combustion;

solenoid valve means connected to said fuel supply pipe and to said circuit means for stopping the flow of fuel therethrough upon interruption of a supply of electric current to said burner.

air damper means for controlling the flow of air to said air supply pipe;

solenoid means connected to said air damper means and to said circuit means for reducing air flow through said damper means upon connection of supply of electric current to said solenoid means and for increasing air flow through said damper means upon interruption of a supply of electric current to said solenoid means;



air fan means connected to said air damper means and said means for connecting for supplying a flow of air through said air supply pipe to said vaporization and ignition means; and

weight means operatively connected to said air fan means for causing said air fan means to continue to rotate due to inertia force upon interruption of a supply of electric current to said burner;

whereby upon interruption of a supply of electric current, said solenoid valve means closes to stop the flow of fuel and said damper means opens to admit a continued flow of air to said vaporization and ignition means to complete combustion of fuel introduced prior to said interruption.

4,544,350

BURNER APPARATUS FOR SIMULTANEOUSLY INCINERATING LIQUID, DRY GAS AND WET GAS STREAMS

Joseph W. Ware, III, Lake Charles; James A. DeBernardi, Sulphur, and James R. Holcomb, Lake Charles, all of La., assignors to Vista Chemical Company, Houston, Tex.

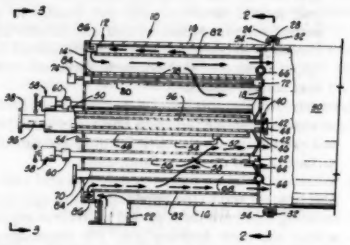
Filed Oct. 27, 1982, Ser. No. 437,002
Int. Cl.⁴ F24C *3/00*; C01B *7/18*
U.S. Cl. 431—285 **7 Claims**

1. An improved burner apparatus for simultaneously incinerating liquid, dry gas and wet gas streams comprising:

a housing having a forward firing wall, a back wall spaced rearwardly from said forward firing wall, and a side wall extending forwardly to said firing wall and rearwardly to said back wall and forming an enclosed plenum chamber, said housing further including a first baffle having a forward end attached to said firing wall and having a rearward end adjacent said back wall, said first baffle being disposed within said side wall so that a primary air plenum is defined by and between said first baffle and said side wall of said housing, there being an air inlet into said primary air plenum; and a perforated second baffle having a forward end attached to said firing wall and having a rearward end attached to said back wall, said second baffle being disposed within said first baffle so that a secondary plenum is defined by and between said first baffle and said second baffle and so that a tertiary plenum is defined by and within said second baffle; and said firing wall including a plurality of air passages in communication with said secondary and tertiary plenums but not with said primary plenum so that air flows through said air passages only from said secondary and tertiary plenums;

a centrally positioned elongated gas burner tube sealingly connected through said back wall, extending longitudinally through said housing within said tertiary plenum and through said firing wall, the rearward end of said gas burner tube having a wet gas and/or dry gas inlet connection attached thereto and the forward end of said tube terminating in a gas burner nozzle positioned adjacent said firing wall;

means for heating gas flowing through said gas burner tube and attached thereto;



at least one liquid burner tube positioned adjacent said gas burner tube within said tertiary plenum and further sealingly connected through said back wall, extending longitudinally through said housing and extending through said firing wall;

means for atomizing a liquid issuing from said liquid burner tube and distributing the atomized liquid produced, and further said liquid burner tube including a liquid stream inlet connection disposed in said liquid burner tube, whereby atomized liquid is distributed from a forward end of said liquid burner tube at a position adjacent said firing wall; and

means for igniting and continuously combusting fuel gas attached to said firing wall and positioned adjacent said gas burner nozzle means and the forward end of said liquid burner tube.

4,544,351

CANDLE HOLDER

Rosalind Marsicano, 933 Calle del Regalo, Green Valley, Ariz. 85614

Filed Mar. 2, 1984, Ser. No. 585,387
Int. Cl.⁴ F23D *3/16*
U.S. Cl. 431—288 **9 Claims**

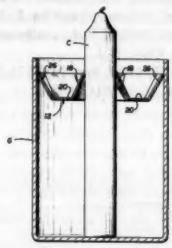
1. In combination, an upwardly extending hollow article having an upstanding side wall, a candle disposed within said hollow article, said candle having a side surface, and a holder supporting said candle in an upright position within said hollow article in spaced relation to said upstanding side wall, said holder being formed from a substantially flat blank of a unitary piece of flexible material having:

a center portion having a plurality of inwardly extending inner tabs in frictional engagement with said side surface of said candle, said inner tabs being bent upwardly by the candle extending therebetween;

a mid-portion surrounding said center portion; and

an outer portion surrounding said mid-portion and having a pluality of outwardly extending outer tabs wherein the outer perpheral edge of said outer portion is in frictional engagement with the inner surface of said side wall of said hollow article to support said candle in an upright position

therein, said outer tabs bent upwardly to engage said side wall;



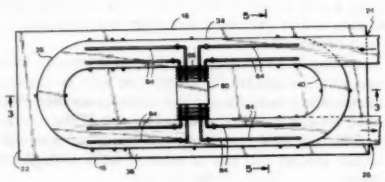
said mid-portion being substantially annular and flat so as to separate said inner fabs from said outer tabs.

4,544,352

BAKING OVEN WITH HEATED AIR DISTRIBUTION

William E. Lanham, Conyers, and Stephen R. Smith, Tucker, both of Ga., assignors to Lanham Machinery Company, Inc.

Filed Dec. 9, 1983, Ser. No. 559,892
Int. Cl.[4] F27B 9/00
U.S. Cl. 432—133 **9 Claims**



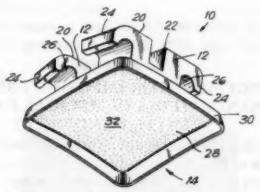
1. A baking oven comprising oven enclosure means including a floor, side walls, a front, a back, and a top wall; a spiral conveyor including an ingress conveyor section for carrying bakery goods to be baked into said enclosure means, a first conveyor tier disposed within said oven enclosure means and coupled to said ingress conveyor section, a plurality of further conveyor tiers disposed within said oven enclosure means and linked serially one above the other, and an egress conveyor section carrying baked bakery goods from a final one of said conveyor tiers out of said oven enclosure means; heating means within said oven enclosure means for heating the air therewithin for baking the bakery goods being carried on said conveyor tiers in said oven enclosure means; and air distribution means taking heated air from near the top wall of said oven enclosure means and distributing the heated air, through a piping conduit network, between at least selected ones of said conveyor tiers, such that the heat distribution within said oven enclosure means is rendered uniform by minimizing stratification of heat within said oven enclosure means, and also such that the amount of energy required for said heating means is reduced, wherein said heating means includes a plurality of heating elements disposed within said oven enclosure means and located parallel to and beneath alternate ones only of the tiers of the spiral conveyor; and wherein said piping conduit network includes a plurality of air distribution pipes within said oven enclosure means and extending parallel to and beneath the remaining ones only of said conveyor tiers.

4,544,353

ORTHODONTIC APPLIANCE FOR DIRECT BONDING TO A TOOTH

Robert S. Maurer, Huntington Beach, and Min H. Tsai, Van Nuys, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Filed Oct. 12, 1982, Ser. No. 434,016
Int. Cl.[4] A61C 7/00
U.S. Cl. 433—9 **5 Claims**



1. An orthodontic direct bond appliance comprising:

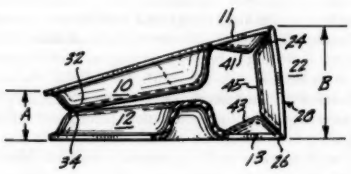
a body having an integral thin base portion extending therefrom, said base portion including a bonding surface wih a rim projecting from the periphery of said surface forming an inside angle with said surface ranging between about 90° to about 170°, said integral thin rim and bonding surface defining a recess adapted for receipt of bonding material, whereby the rim shears off any excess flash.

4,544,354

ANTERIORLY BRIDGED DENTAL TRAYS

Kenneth W. Gores, 1026 - 112th St. N.E., Bellevue, Wash. 98004, and Carolyn C. Gores, 827 Lake St., Kirkland, Wash. 98023

Filed Sep. 21, 1984, Ser. No. 652,636
Int. Cl.[4] A61C 9/00
U.S. Cl. 433—42 **5 Claims**



1. In dental apparatus that comprises a pair of U-shaped dentition troughs, formed of soft, form-retaining plastic material, formed by a bridging member connected at each end between anterior upper edges of said troughs, the improvement, comprising:

said bridging member having a pair of fold-defining transverse creases, each crease being spaced from its joinder with an upper anterior edge of one of said troughs:

said transverse creases being spaced apart to define between them, a connector leg of a length such that when the troughs, through folding of said creases, are brought into bottom-to-bottom juxtaposed relation, the upper anterior ends of said troughs are maintained spaced apart a distance greater than the combined thickness of the posterior extremities of said troughs; and

said connector leg being provided with means stiffening the same against significant bowing while subject to the pressures normally occurring when said troughs are brought into the described bottom-to-bottom juxtaposed relation as the apparatus is disposed for insertion into a person's mouth whereby the connector leg tends to bias the denti-

tion troughs into intimate relation to the user's teeth while the apparatus is in place in the user's mouth.

4,544,355

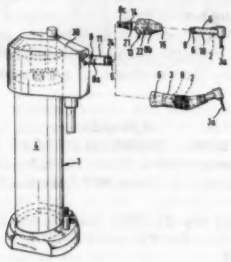
ARRANGEMENT FOR IMPOSING PRESSURE ON MAINTENANCE MEDIA IN MEDICAL PARTICULARLY DENTAL HANDPIECES

Eugen Eibofner, Biberach, and Ernst Strohmaier, Bad Schussenried, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 376,040, May 7, 1982, abandoned. This application May 15, 1984, Ser. No. 610,189

Int. Cl.[4] A61C *1/02*

U.S. Cl. 433—104 **20 Claims**



1. In an arrangement for pressurizing a maintenance medium, such as a cleaning media and a lubricant, to supply it under pressure to the movable components of different dental handpieces, including a housing having an outlet opening, a motion drive means in said housing for driving the movable components of the handpieces, a maintenance medium pressure drive means acting through said outlet opening and through an inlet opening in a handpiece communicating with the outlet opening so as to place said maintenance medium under pressure, with the movable components of the handpiece being driven by the motion drive means of the housing while under pressurization of the maintenance medium, and in which engaging means on said motion drive which are accessible through said outlet opening engage cooperating engaging means on the movable components of the handpiece which are accessible through the inlet opening to drive the movable components of the handpieces; the improvement comprising: a plurality of different attachment heads securable, one at a time, to the outlet opening on said housing, each attachment head including a passageway for allowing the maintenance media to be conveyed therethrough to the movable components of the handpiece, and said plurality including a first attachment head having a first type of output motion drive for engagement with a first type of input motion drive to a first type of handpiece, and at least one additional second attachment head having a second type of output motion dirve, different from and incompatible with said first type of input motion drive, for engagement with a second type of input motion drive to a second type of handpiece, with only one of said plurality of different attachment heads being mounted on said outlet opening at one time, and being replaceable one at a time by another different attachment head.

4,544,356

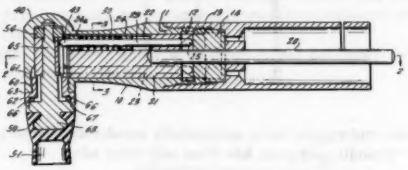
RECIPROCATING DENTAL PROPHYLACTIC ANGULAR DEVICE

John M. Gardella, Matawan, N.J.; Casimir Ciepierski, Staten Island, N.Y.; Michael Alfano, Franklin Lakes, and Tiang-Shing Chang, Westfield, both of N.J., assignors to Block Drug Company Inc., Jersey City, N.J.

Filed Nov. 15, 1984, Ser. No. 671,739

Int. Cl.[4] A61C *1/07*

U.S. Cl. 433—122 **7 Claims**



1. A dental device comprising:

a drive member and a driven member;

a housing for the drive member and a housing for the driven member;

the driven member comprising an oscillatable cylinder carrying a dental treatment member at the end thereof and at a right angle to the housing for the drive member;

a rotatable member in the drive housing having a longitudinal bore parallel to the axis of rotation and an operating rod in said bore; said operating rod being translatable about the axis of rotation of said rotatable member;

a stationary cam within said housing, said operating rod having a cam follower head at one end operating against said cam and an extension therefrom interengaging a slot in said oscillatable cylinder;

said operating rod being oscillated by said cam on translational rotation of said operating rod, said oscillation of said operating rod causing the cylinder to receiprocate around its axis and the interengagement of the operation rod with the slot permitting the operating rod end to translate around said axis of rotation while engaging said cylinder.

4,544,357

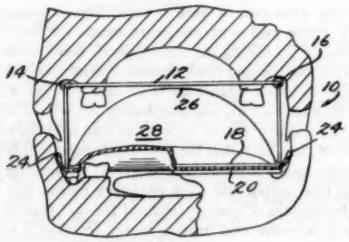
THROAT GUARD APPARATUS

Aaron T. Williams, 4023 SE. 19th Pl., #107, Cape Coral, Fla. 33904

Filed Jul. 15, 1983, Ser. No. 514,031

Int. Cl.[4] A61C *5/14*

U.S. Cl. 433—136 **13 Claims**



1. A throat guard apparatus intended for insertion into the mouth of a patient so as to assist in preventing small objects from passing into the patient's throat, said apparatus comprising:

a throat guard of two dimensional flexible sheet material hav-

ing a forward oversized portion of a size to overlie and project beyond the tongue and teeth of the patient's lower jaw arch and a rear leaf portion foldable upwardly and forwardly for obstructing the passage from the mouth to the throat of a patient, said rear portion being integrally connected to said forward portion and being shaped to fold upwardly so as to meet a patient's upper hard palate, and

a retaining device comprising:

a. first means for releasably retaining the oversized portion of said sheet material in a generally horizontal plane covering the patient's lower arch and the rear throat area wherein a rear-most portion of said first means is generally curved upwardly to the rear towards an anchoring position and does not retain said throat guard material,

b. second means for resiliently engaging an upper portion of the mouth while being resiliently connected at a rear-most portion with the rear-most portion of said first means so as to offer spring bias and assist in maintaining said first means in place in the mouth cavity but not to retain said sheet material,

c. anchoring means resiliently connecting the rear-most portions of said first and second means and adapted to reside at said anchoring position between the upper gums and cheek in rear of the mouth,

d. wherein said first means comprises two generally U-shaped resilient elements adapted to reside between lower gums and inner lower cheek having their respective opposite ends resiliently biased towards each other and secured in said anchoring means, and wherein said second means comprises a generally U-shaped resilient element adapted to reside between upper gums and inner lower cheek having opposite ends each also retained in said anchoring means and extending away from said two elements of said first means to collectively define a bi-valve retaining frame.

4,544,358

DENTURE FIXTURES

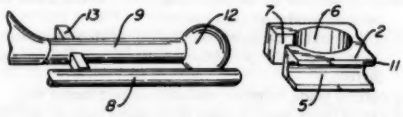
Jose T. Montero, Andres Obispo, 37, Madrid-33, Spain

Filed Apr. 2, 1984, Ser. No. 595,862

Claims priority, application Spain, May 23, 1983, 272.396; Jan. 13, 1984, 276.825

Int. Cl.[4] A61C *13/22*

U.S. Cl. 433—172 **4 Claims**



1. A denture fixture for positioning and stabilizing a denture to a tooth, the tooth being adjacent the denture and embedded in gums and having a substantially upright tooth axis, the denture fixture comprising:

anchoring means affixed to the denture and having first and second stems resiliently extending from the denture toward the tooth, the first stem including a reduced diameter section and an enlarged portion spaced apart from the denture, and the second stem being in parallel, spaced apart relationship to the first stem and lying in a substantially horizontal plane which includes the first stem; and

retention means mounted to the tooth in the region of the gums and extending toward the denture over the gums to a retention means end, the retention means having:

a substantially cylindrical aperture for receiving the enlarged portion of the first stem, the cylindrical aperture being aligned approximately parallel to the tooth,

a first channel extending between the aperture and the retention means end and being formed to receive a section of the first stem located between the enlarged portion and the denture, and

a longitudinal second channel substantially parallel to and spaced apart from the first channel for receiving a portion of the second stem.

4,544,359

DENTAL RESTORATIVE MATERIAL

Samuel Waknine, Wallingford, Conn., assignor to Pentron Corporation, Wallingford, Conn.

Continuation-in-part of Ser. No. 570,366, Jan. 13, 1984, abandoned. This application Dec. 3, 1984, Ser. No. 677,595

Int. Cl.[4] A61K *6/08*

U.S. Cl. 523–115 **19 Claims**

1. In a dental restorative material comprising 20–30% by weight of a visible light polymerizable methacrylic ester monomeric system, from about 65–79% by weight of an inorganic filler and from about 1–5% by weight of collidal fumed silica; said inorganic filler having an average particle size diameter ranging from about 0.5 to 5 microns and said collidal fumed silica having an average particle size ranging from about 0.01 to about 0.05 micron, the improvement comprising subjecting the filler to a series of milling steps comprising (1) wet milling in aqueous medium having a pH of 5–7; (2) surface etch milling in an aqueous etchant medium and (3) a silanizing milling in a silane solution.

4,544,360

BOOK REFERENCE LIST

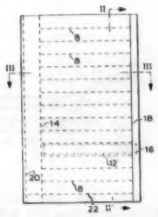
Joseph Goodman, 39, Hillside Ct., Finchley Rd., London, England (NW3)

Filed Jul. 3, 1984, Ser. No. 627,434

Claims priority, application United Kingdom, Jul. 8, 1983, 8318474

Int. Cl.[4] G09B *1/06*

U.S. Cl. 434—178 **7 Claims**



1. A memory aid for use with a book, comprising:

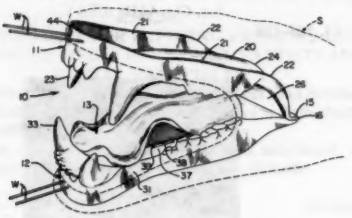
a sheet having inscribed thereon information related to the contents of the book, which information is arranged in a predetermined sequence,

a holder having transparent pockets, said holder retaining said sheet, and

masking means including opaque strips removably receivable in said transparent pockets, each strip overlying a line of information and adapted to be removed by the reader as required so as to provide a memory aid in which only

information relating to parts of the book already read is revealed.

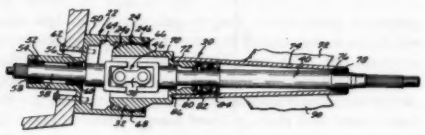
4,544,361
ARTIFICIAL ANIMAL JAW
Onno Van Veen, Aurora, and Dale B. Knobloch, Conifer, both of Colo., assignors to Jonas Brothers, Inc., Denver, Colo.
Filed Aug. 16, 1984, Ser. No. 641,853
Int. Cl.[4] G09B *23/36*
U.S. Cl. 434—296 **11 Claims**



1. In an artificial jaw set for use in taxidermy forms wherein upper and lower jaw members include simulated palate portions, integrated teeth and gum portions provided along the front and side edges of each said palate portion and rear edges opposite said front edges on said upper and lower palate portions disposed in complementary relation to one another, the improvement comprising:

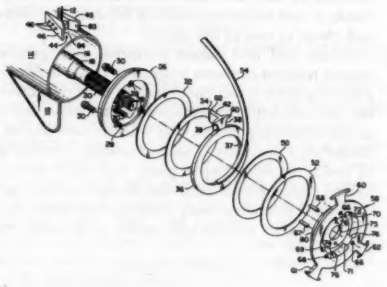
hinge means pivotally interconnecting said upper and lower jaw members for movement toward and away from each other, comprising locator means disposed on one of said rear edges and projecting in a direction toward the other of said jaw members for snap-fitting insertion into corresponding slot means disposed adjacent the other of said rear edges of said other jaw member, said locator means being frictionally retained at a selected position within said slot means and movable through said slot means to a selected position in response to the application of positive pressure to said upper and lower jaw members.

4,544,362
MARINE OUTDRIVE APPARATUS
Howard M. Arneson, 6 Locksley La., San Rafael, Calif. 94901
Continuation of Ser. No. 359,007, Mar. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 137,797, Apr. 7, 1980, abandoned. This application Mar. 14, 1985, Ser. No. 712,337
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **4 Claims**



1. Marine outdrive apparatus for a boat having an inboard engine and a transom comprising: a support casing adapted to extend rearwardly from the transom; means on the rear end of the support casing for forming a ball-receiving socket; a propeller shaft carrier having a forward end and a rear end and provided with a hollow pivot ball mounted thereon at the forward end thereof, said ball being pivotally received within said socket to permit universal movement of the ball about a pivot point relative to the socket, said socket being formed from a pair of rings, each ring having an inner peripheral face complementally engaging the adjacent outer surface portion of said ball, there being an O-ring seal between the rings and in sealing relationship to the ball; a rotatable drive shaft in said support casing and adapted to be connected to said inboard engine; a propeller shaft journalled in said propeller shaft carrier; universal joint means interconnecting the drive shaft and the propeller shaft at a location within the ball, the center of said universal joint means substantially coinciding with the pivot point of the ball, whereby the propeller shaft carrier and the propeller shaft can pivot laterally about a steering axis and up and down about a trim axis; a propeller mounted on the rear end of the propeller shaft for rotation therewith; and means coupled with the propeller shaft carrier for pivoting the same about the steering axis and about the trim axis.

4,544,363
LINE CUTTER FOR OUTBOARD AND INBOARD/OUTBOARD MOTORS
Donald T. Govan, P.O. Box 350246, Ft. Lauderdale, Fla. 33335
Filed Mar. 18, 1985, Ser. No. 713,301
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—73 **13 Claims**



1. An apparatus that cuts lines, nets and weeds of the type that may be encountered by propeller driven vessels of outboard and inboard/outboard design when under way, said vessels of the type where the propeller is mounted to a rotatable propeller shaft that extends rearwardly from a propeller shaft housing that depends to a vessel's hull, comprising:

keeper bracket means fixedly secured to said propeller shaft housing,

said keeper bracket means configured to define a rearwardly opening wedge-shaped cavity,

a non-rotatably mounted annular cutter ring disposed transversely to said propeller shaft, in encircling relation thereto,

a cutting blade member mounted on said cutter ring,

a pair of shear edges formed on opposite sides of said cutting blade member,

a projecting wedge-shaped member formed on said cutting blade member and extending in a forward direction into the rearwardly-opening cavity defined by said keeper bracket means,

a rotatably mounted annular bolt ring disposed intermediate said cutter ring and said propeller shaft housing,

a rotatably mounted annular cutter ring mounted rearwardly of said non-rotatably mounted cutter ring so that said non-rotating cutting ring is disposed in sandwiched relation to said bolt ring and said rotatable cutter ring,

a plurality of circumferentially spaced cutting blade members mounted on said rotatable cutter ring,

a pair of shear edges formed on opposite sides of each of said plurality of cutting blade members,

said propeller shaft having a taper formed therein,

a centrally apertured inner ring member of reduced diameter formed as a part of said rotatable cutter ring,

said central aperture configured in the form of a taper that corresponds to the taper formed in the propeller shaft,

said projecting wedge member entering into abutting engagement with said keeper bracket means attendant rotation of said propeller shaft,

said projecting wedge member entering into firm wedging engagement with said keeper bracket means substantially instantaneously upon the introduction of a load on said apparatus,

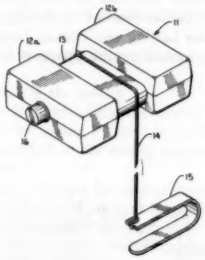
and said taper formed in said central aperture of said inner ring being driven onto the taper formed in the propeller shaft attendant tightening of said propeller onto said propeller shaft by a mount nut.

4,544,364

ILLUMINATED BUOY MARKER

Patrick D. Bankston, 24 Duncan Dr., Buford, Ga. 30518

Filed Feb. 10, 1984, Ser. No. 578,821
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—6 **8 Claims**



1. An improved self-setting illuminated buoy marker comprising:

a hollow, translucent buoyant marker buoy having an elongated bifurcated body, said body including a central axis member connecting two end sections;

an anchor line having one end thereof connected to said central axis member and capable of being wound there around, the other end of said line having an anchor member connected thereto;

a lighting device mounted integrally within the hollow, bouyant body of said marker buoy, said lighting device producing diffused, low-intensity illumination through said translucent buoyant body, said lighting device comprising a light source;

means associated with an outside wall of an end section and supporting said light source within the body;

an opening formed in said outside wall for access to said lighting device within the buoy; and

water-tight closing means selectably associated with said outside wall to close said opening and maintain said lighting device within said buoy, wherein said lighting device is selectably accessible through said opening in said outside wall, and wherein the produced illumination is visible from all directions whereby when in position over a selected fishing location the buoy is visible to the angler from any direction in daylight or darkness regardless of wind or wave conditions.

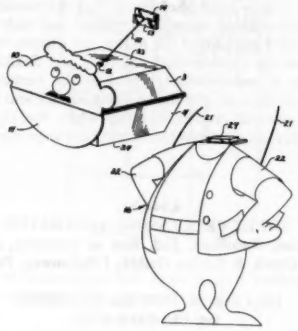
4,544,365

PUPPET

James E. Donovan, 813 West Ave., Buffalo, N.Y. 14213

Filed Dec. 1, 1983, Ser. No. 556,972
Int. Cl.[4] A63H *3/20, 3/14*
U.S. Cl. 446—73 **8 Claims**

1. A hand-operated puppet constructed from a hamburger container having an upper lid member, a lower lid member and means hingedly joining said members, comprising a face attachment attached to said container and finger accomodation means on said parts in working relationship to the hinge joint of said container, said face attachment being provided on the front portion of said container and said finger accomodation means being provided on the back hinged portion of said container, said finger accomodation means being positioned at least one in or on the upper lid back portion of the container and at least one in or on the lower bottom back portion of the container, said face attachment being in two parts, one part connected to the front lid portion of the container and the other face part connected to the front lower portion of the



container, said finger accomodation means being adapted to permit said container to be one-handedly manipulated to open and and closed positions to represent opening and closing a mouth portion of said puppet, and wherein a puppet body portion is attached to the lower section of said container said puppet body portion having at least one limb movably connected thereto, and means connecting said limb to said container for causing movement of said limb relative to said body portion when said members are moved relative to each other.

4,544,366

SHEARING APPARATUS

Eldon W. Krehbiel, Rte. 2, Hydro, Okla. 73048

Continuation-in-part of Ser. No. 012,851, Feb. 16, 1979, abandoned. This application Feb. 8, 1983, Ser. No. 464,921
Int. Cl.[4] B26B *19/24*
U.S. Cl. 30—216 **6 Claims**

1. An improved shearing apparatus supportable from an overhead member for shearing wool of a sheep positioned generally below the shearing apparatus on a working surface, the shearing apparatus comprising:

a motor having a selectively rotatable drive shaft;

suspension means connected to the over-head member for supporting the motor in an equilibrium position in which the drive shaft depends downwardly in a substantially vertical direction from the motor in a direction of the working surface, the suspension means permitting substantially free movement of the motor along a pendular path;

a clipper head assembly having cutter blades and a rotatable

driven shaft, the cutter blades operable by rotation of the driven shaft;

a flexible shaft assembly connected to the drive shaft of the motor and the driver head of the clipper assembly for transmitting rotational motion of the drive shaft of the motor to the rotatable driven shaft of the clipper head assembly, the flexible shaft assembly having a length of from about 50 to about 70 inches and comprising an inner core portion formed of wound steel wires and a housing for encasing the core portion; and,

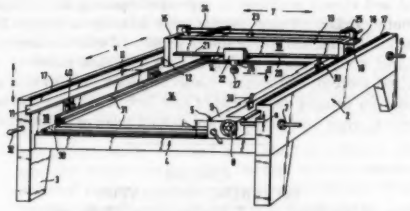
a connector means for connecting the flexible shaft assembly to the clipper head assembly so that the rotatable head of the clipper head assembly is rotated and such that in the connected position of the motor, the clipper head assembly and the flexible shaft assembly, the flexible shaft assembly is approximately equal to the vertical distance between the motor of the working surface and the flexible shaft assembly resists twisting when the clipper head assembly encounters a load during the shearing of wool of sheep.

4,544,367

SHEET PROCESSING APPARATUS

Franz Vossen, Radolfzell, Fed. Rep. of Germany, assignor to Meurer Druck & Carton GmbH, Libellenweg, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,904
Int. Cl.[4] B31B *1/25*
U.S. Cl. 493—1 **17 Claims**



1. Apparatus for processing a sheet of material, comprising: a table plate adapted to receive a stamping plate for receiving a said sheet of material thereon; a stamping tool operatively associated with the stamping plate; a form means; tool holding means for releasably carrying the form means substantially parallel to the table plate; guide track means extending over the table plate at a spacing therefrom and disposed movably thereabove; carriage means carried on the guide track means and movable in a direction transverse with respect to the direction of movement of the guide track means; at least one vertically movable pressure member carried on the carriage means and operatively directed towards said table plate; and at least one lateral defining member which is arranged on the table plate in such a way as to be movable and fixable in a steplessly variable manner thereon wherein said lateral defining member carries holding means for said form means.

4,544,368

CASE PRESENTER APPARATUS AND METHOD

Raymond A. Labombarde, Daniel Webster Hwy. South, Nashua, N.H. 03061

Filed May 10, 1984, Ser. No. 608,730
Int. Cl.[4] B31B *1/54, 3/02*
U.S. Cl. 493—27 **10 Claims**

1. Apparatus for presenting a single, flat, corrugated case, to an operator station of a case packer device,

for erection and insertion in a case gripper, said apparatus comprising:

a magazine for holding a plurality of said cases in a stack;

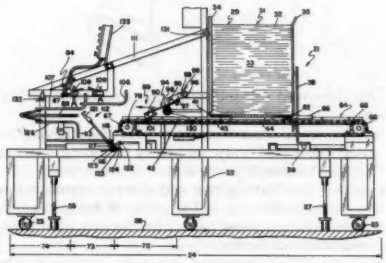
said magazine having a bottom feed mechanism for advancing each bottom-most flat case in said stack, individually and successively along a path extending from said magazine to said station, with the leading upper major and minor closure flaps superposed on the leading lower major and minor closure flaps;

a plurality of upper folding hooks pivotally mounted above said path downstream of said magazine, the hooks thereof being of predetermined length about equal to the thickness of the corrugated so as to overfold said leading upper major and minor closure flaps without engaging the leading lower major and minor closure flaps;

a plurality of lower folding hooks pivotally mounted below said path, downstream of said upper folding hooks, the hooks thereof being located to underfold said leading lower major and minor closure flaps;

upper hold down bars, above said path, and lower hold down bars, below said path, for holding said flaps in open, folded position downstream of said folding hooks along said path;

and sensing means upstream of said operation station, responsive to the arrival of each successive individual folded case for halting said bottom feed mechanism until the case is removed by the operator and then recycling



said mechanism to advance the next successive flat case in said stack along said path.

10. The method of presenting a plurality of flat, tubular, corrugated cases to the operator station of a case packer with the leading flaps overfolded ready for erection and insertion into a case gripper, by means of a bottom feed magazine, upper folding means, and lower folding means which comprises the steps of:

feeding a plurality of flat, tubular corrugated cases, individually and successively from said magazine along a path up to said operator station;

overfolding the leading upper major and minor closure flaps of each case advancing along said path, downstream of said 12 magazine, without overfolding the leading lower major and minor closure flaps thereof;

then under folding the leading lower major and minor closure flaps of each said case further downstream of said path;

holding down all of said overfolded flaps along said path;

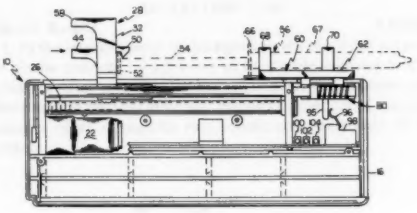
and halting the feed of said flats while a flat is present ready for removal by an operator, but actuating said feed to deliver the next successive flat in said magazine, each time such removal occurs.

4,544,369

BATTERY OPERATED MINIATURE SYRINGE INFUSION PUMP

James G. Skakoon, Norwood; Donald L. Johanson, Wayland, both of Mass., and Raymond J. Bonthron, New Providence, N.J., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 22, 1983, Ser. No. 554,368
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—155 **15 Claims**



1. A syringe infusion pump comprising:
a casing;
a motor supported by the casing;
electronic means for controlling the motor;
battery means in the casing for energizing the motor;
a lead screw supported on the casing and rotatably coupled with the motor;
support means on the casing for supporting a syringe having a cylinder and piston, the support means including acceptance means for accepting syringes from various syringe manufactures, the support means including a base provided with a slot for receiving the flange of a syringe cylinder for preventing reverse longitudinal movement thereof so that longitudinal movement of the cylinder will be transmitted to the base, and spring means within the casing cooperating with the base to bias the base and adapted to be overcome by movement of the flange and base, said acceptance means including a base, a pair of upstanding laterally flexible clips on the base receiving the syringes; and
coupling means for coupling the piston with the lead screw for driving the piston into the cylinder upon rotation of the lead screw.

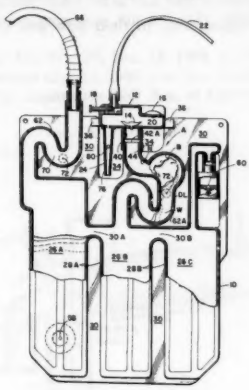
4,544,370

AIR LEAK DETECTION SYSTEM FOR CHEST FLUID COLLECTION BOTTLES AND BLOW-OUT PREVENTION BAFFLE

Donald P. Elliott, Denver, and William L. Halseth, Parker, both of Colo., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed May 24, 1982, Ser. No. 381,161
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—319 **6 Claims**

1. A non-water seal thoracic drainage system comprising:
a collection bottle with an intake opening connectable to receive fluid from a patient's pleural cavity and an air outlet downstream of said intake opening connectable to a source of negative pressure
means defining a fluid collection chamber with an air space thereabove, said air space being disposed along the flow path between said intake opening and air outlet,
one-way waterless valve means interposed along the flow path defined from the chamber toward the outlet, said waterless valve means being operative to admit air in a direction from the chamber while preventing reverse flow,
said one-way waterless valve means being operative to prevent said reverse flow unaided by underwater seals and comprising the sole means therefor,
a transparent U-tube interposed along the flow path between said air outlet and air space, said transparent U-tube, when filled with fluid, being adapted to provide a visual indication of an upstream air leak in the form of bubbles migrating through the fluid contained therein.

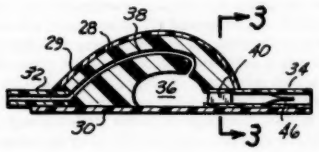


4,544,371

IMPLANTABLE METERED DOSE DRUG DELIVERY SYSTEM

Ray H. Dormandy, Jr., Goleta, and Frederick L. Coe, Santa Barbara, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 5, 1982, Ser. No. 433,053
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—891 **23 Claims**



1. An implantable metered dose drug delivery system comprising:
a puncturable and resealable injection site for providing an access to the system;
a reservoir in fluid-flow communication with the injection site;
a metering valve means in fluid-flow communication with the reservoir for measuring and storing a dosage amount of a drug to be administered and delivering the drug in dosage amounts upon external actuation, the metering valve means comprising a base, a resilient elastomeric solid body attached to the base, which resilient elastomeric solid body defines a chamber and a fluid passageway extending along its entire length within the resilient elastomeric solid body and which fluid passageway is in fluid communication with the chamber and deformable upon application of an external pressure applied to the resilient elastomeric solid body, an inlet conduit attached to the resilient elastomeric solid body in fluid-flow communication with the fluid passageway, an outlet conduit attached to the resilient elastomeric solid body in fluid-flow communication with the chamber, and a one-way valve means provided within the outlet conduit for opening and providing fluid flow from the chamber through the outlet conduit upon an external pressure being applied

against the resilient elastomeric solid body, which external pressure collapses the fluid passageway occluding the fluid passageway to fluid flow and concomitantly collapses the chamber expelling any drug in the chamber from the chamber; and

a delivery catheter fluid-flow communication with the metering valve means for delivering the drug dosage to the body.

4,544,372

PROCESS FOR IMPROVING THE LIGHT FASTNESS OF POLYAMIDE DYEINGS

Klaus-Peter Heise, Bergisch Gladbach; Robert Kuth; Karl Neufang, both of Cologne; Hellmuth Pantke, Leichlingen, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

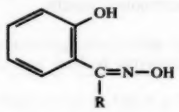
Filed Dec. 2, 1983, Ser. No. 557,687

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247051

Int. Cl.[4] D06P *1/64*

U.S. Cl. 8—602 8 Claims

1. In the improvement of the lightfastness of a dyed polyamide textile material by applying to the textile material before, during or after dyeing a fastness improver, the improvement wherein such fastness improver consists essentially of a copper complex of an optionally ring substituted compound of the formula



in which R is H, OH, alkyl or cycloalkyl.

4,544,373

2,4-DINITRO-2'-ACYLAMINO-4'-DIALKYLAMINO-5'-ALKOXY-ALKYLENEOXY-1,1'-AZOBEZENE DYES

Angelo Della Casa, Basel, and Peter Aeschlimann, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

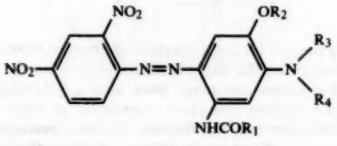
Continuation of Ser. No. 884,669, Mar. 8, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 130,793

Claims priority, application Luxembourg, Mar. 16, 1977, 76959; May 4, 1977, 77251

Int. Cl.[4] C09B *29/24, 29/26;* D06P *1/18, 3/54*

U.S. Cl. 8—639 6 Claims

1. An azo dye of the formula



wherein

R_1 is methyl or ethyl,

R_2 is alkyl of 1 to 4 carbon atoms which is substituted by alkoxy of 1 to 4 carbon atoms, and

R_3 and R_4 are ethyl;

or mixtures of said dye with a dye of said formula, wherein R_1, R_2 and R_3 are selected as above, but wherein R_4 is hydrogen.

4,544,374

APPARATUS FOR BURNING ORGANIC MATERIALS

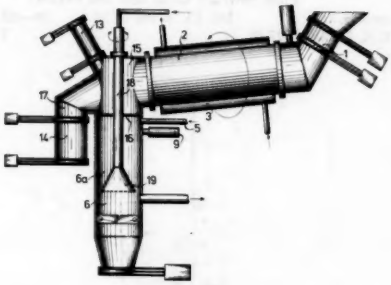
Heinz Mallek, Linnich-Tetz; Manfred Laser, Jülich-Koslar, and Dorothee Ermisch, Essen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Division of Ser. No. 331,197, Dec. 16, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,902

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049250

Int. Cl.[4] C10J *3/20*

U.S. Cl. 48—114 1 Claim



1. Apparatus of the shaft-furnace type for burning organic waste matter, comprising in addition to a furnace shaft (**4**) and a combustion chamber (**6**) below it:

a pretreatment chamber (**2**) having means (**3**) for heating waste material contained therein, with exclusion of air, up to a temperature in the range from 400° to 550° C. constructed near the top of said shaft and disposed so as to discharge degassed waste material into a region of the interior of said shaft substantially at the top of said furnace shaft, said pretreatment chamber (**2**) being provided in the form of a rotary drum (**2**) having its axis inclined to the horizontal for gravity feed of the contents to said furnace shaft, being equipped at its input with a gas-tight sluice system (**1**) and arranged to discharge into a chamber extending over and somewhat around the upper part of said furnace shaft which is equipped with at least one gas-tight sluice (**13, 14**) for access between the interior and exterior;

means (**5**) for supplying a gasification-promoting gas at the top of said furnace shaft for downward passage thereof to said furnace shaft;

means (**7, 19**) for separating said furance shaft from said combustion chamber so as to hold organic material in said shaft for the course of a gasifying reaction and providing a narrow passage to said combustion chamber there below at least for gases and equipped wtih means for controlling the admission of material to be burned past the said separating means into said combustion chamber, said separating means situated so as to form the top of said combustion chamber and said furnace shaft being constructed so as to extend directly upward from said separating means;

a shake-sieve (**16**) provided in said furnace shaft, defining the bottom of said chamber at the top of the furnace shaft in which said rotary drum discharges, said shake-sieve covering at least a major part of a portion of said furnace shaft (**4**) above said separating means (**19**) said chamber at the top of said furnace shaft connecting with a side shaft (**17**) located opposite said rotary drum with respect to said furnace shaft and being equipped with a said gas-tight access sluice (**14**) for removal of incombustible material that does not pass downward through said sieve, and

means (**8, 9**) for maintaining combusition in said combustion chamber and for thereby giving off heat to said furnace

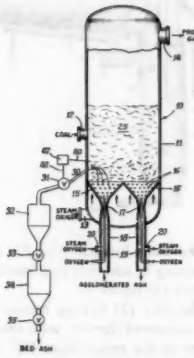
shaft in sufficient quantity for heating the contents of said furnace shaft resting on said separating means to a temperature substantially above 550° C. for gasification of a gasifiable organic material included in said contents.

4,544,375

APPARATUS AND PROCESS FOR CONTROLLING FLUIDIZED BEDS

Amirali G. Rehmat, Westmont, and Jitendra G. Patel, Bolingbrook, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 25, 1983, Ser. No. 555,047
Int. Cl.⁴ C10J *3/54*
U.S. Cl. 48—197 R **17 Claims**



1. A process for maintaining fluidization during non-steady state operating conditions of a fluidized bed comprising solid carbonaceous materials for oxidation or gasification reactions comprising the steps: measuring the ash content relative to carbon content of fluidized solid carbonaceous materials within said fluidized bed; opening ash removal valve means in an ash removal conduit when said ash content measurement exceeds a first predetermined amount which is above a suitable ratio of ash to carbon and below the ash content at which sintering takes place and removing solid particulates comprising ash from said fluidized bed through said removal conduit while maintaining said solid carbonaceous material input; and continuing measurement of ash content within said fluidized bed and closing said ash removal valve means when said continuing measurement of ash content is reduced to a second predetermined amount which is below said suitable ratio of ash to carbon, providing controlled fluidization of said fluidized bed.

4,544,376

ABRASIVE SLURRY COMPOSITION FOR MACHINING BORON CARBIDE

Edward L. Duran, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1984, Ser. No. 676,045
Int. Cl.⁴ B24D *3/00*
U.S. Cl. 51—293 **6 Claims**

1. An abrasive slurry composition for use in the drilling or machining of solid boron carbide, consisting essentially of a carrier solution of octyl alcohol and alkylaryl polyether alcohol, and grit selected from the group consisting of boron carbide grit and silicon carbide grit and mixtures thereof.

4,544,377

GRINDING, LAPPING, AND POLISHING COMPOUNDS

Roland Schwen, Friedelsheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,486
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314789
Int. Cl.⁴ C09K *3/14*
U.S. Cl. 51—298 **13 Claims**

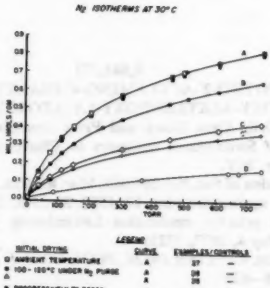
1. A grinding, lapping, and polishing compound comprising
(a) from about 10% by weight to about 70% by weight finely dispersed abrasive material,
(b) from about 5% by weight to about 15% by weight thickening agent, and,
(c) from about 15% by weight to about 85% by weight polymeric glycol of ethylene oxide, propylene oxide, and/or butylene oxide or its monoethers with a low-molecular-weight alcohol having a molecular weight of about 55 to 25,000 as the compound base, all percentages based on the compound weight.

4,544,378

NITROGEN ADSORPTION PROCESS

Charles G. Coe, Macungie, and Steven M. Kuznicki, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 441,822, Nov. 15, 1982, Pat. No. 4,481,018. This application May 24, 1984, Ser. No. 614,086
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—68 **10 Claims**



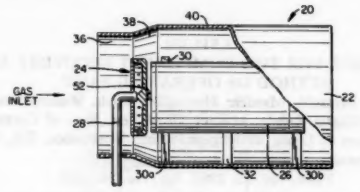
1. In a process for the adsorption of nitrogen from nitrogen-containing gases, the improvement which comprises contacting said nitrogen-containing gases with a polyvalent cation exchanged zeolitic adsorbent containing at least 50% by weight faujasite and the faujasite portion thereof having a majority of its exchangeable cations present in the polyvalent cation exchanged form, said adsorbent having been dehydrated in such a manner as to minimize the amount of water in the gaseous environment in contact with said adsorbent during this dehydration step to a partial pressure of water of less than about 0.4 atmospheres at temperatures above 150° up to about 650° C. thereby resulting in a preponderance of its polyvalent ions in a dehydrated/dehydroxylated state.

4,544,379

METHOD FOR METAL HALIDE REMOVAL

Henry H. Elliott; Lawrence R. Lepovitz, and Dale G. Jones, all of Visalia, Calif., assignors to Emcotek, Visalia, Calif.

Continuation-in-part of Ser. No. 760,362, filed as PCT US83/00394, Mar. 13, 1983, published as WO84/03641, Sep. 27, 1984, § 102(e) date Jun. 28, 1985
Filed Jul. 16, 1984, Ser. No. 630,920
Int. Cl.[4] B01D *47/08*
U.S. Cl. 55—71 7 Claims



1. A method for removing metal halide hydrolysis products from an air stream, said method employing a rotary spray scrubber including:

a substantially cylindrical duct which defines an axial flow path for the air stream;

a rotatable dispersion hub coaxially mounted in the duct, said hub including a circular periphery having a plurality of radial passages;

wherein the cylindrical duct and the hub together define an annular passage therebetween in the axial direction, and wherein the ratio of the hub diameter to the duct diameter at said annular passage is in the range from about 0.55 to 0.75;

said method comprising:

rotating the hub at a preselected rotational speed;

supplying liquid scrubbing medium to the passages in the hub so that a radial spray is directed to the annular passage between the hub and the duct; and

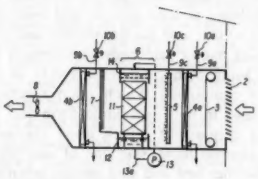
directing the air stream flow through the annular passage whereby the radial spray impacts the particulates to remove them from the air stream.

4,544,380

AIR CONDITIONER FOR A COATING BOOTH

Zyouzi Itou, and Synith Akiyama, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 30, 1983, Ser. No. 509,381
Claims priority, application Japan, Dec. 17, 1982, 57-221604
Int. Cl.[4] B01D *47/06*
U.S. Cl. 55—80 8 Claims



1. An air conditioner for a coating enclosure comprising:

means for drawing air through an air filter;

first means for heating said filtered air;

means for humidifying said heated air by contacting said air with heated water flowing on wet walls;

second means for reheating said humidified air, means for feeding said reheated and humidified air into said coating enclosure, and

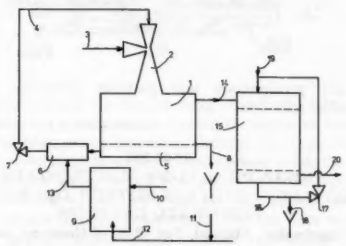
steam atomization means provided between, in the direction of flow of said air, said first means for heating the air and said means for humidifying the air, said steam atomizing means being constructed for spraying steam directly toward said wet walls to heat said water.

4,544,381

PROCESS FOR REMOVAL OF EMISSION GAS POLLUTANTS BY BIOLOGICAL MEANS

Friedrich Schmidt, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,483
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326057
Int. Cl.[4] B21D *47/00*
U.S. Cl. 55—89 8 Claims



1. Method for scrubbing gases containing oxygen, that are polluted by biodegradable substances, by bringing them into contact with an aqueous suspension of microorganisms such that:

(a) the period of contact between gas and suspension is 0.5–5 seconds;

(b) the suspension is brought into contact with the gas again after a retention time of 3–10 minutes has been attained;

(c) the suspension is continuously supplied with active biomass in amounts between 0.5% and 5% of the aqueous suspension whereby

(d) the excess suspension is drawn off.

4,544,382

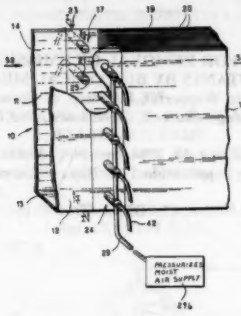
APPARATUS FOR SEPARATING PARTICLES IN SUSPENSION IN A GAS

Joseph Taillet, Boulogne, and Serge Larigaldie, Chatenay Malabry, both of France, assignors to Office National d'Etudes et de Recherches Aeropspatiales (ONERA), France

Division of Ser. No. 266,587, May 22, 1981, Pat. No. 4,435,190.
This application Nov. 22, 1983, Ser. No. 550,904
Claims priority, application France, May 19, 1980, 80 11945; May 14, 1981, 81 09646
Int. Cl.[4] B03C *3/00*
U.S. Cl. 55—107 11 Claims

1. An electrostatic separator including an enclosure for receiving a gas stream containing particles to be separated therefrom, a chamber distinct from said enclosure, a conductive supersonic tuyere having an inlet communicating with said chamber, an outlet at least partially defining an opening communication with said enclosure, and a neck intermediate said inlet and outlet means for introducing a moist gas into said chamber under pressure so as to cause its supersonic expansion in the tuyere, a tapered electrode with an apex located in said chamber and extending into the tuyere with said apex situated close to the neck thereof, means for establishing a continuous high voltage between said tuyere and said electrode to produce a corona discharge in the gas flowing through said tuyere, the arrangement being such that, in use, the resulting ions become entrapped in microscopic ice crystals formed in said tuyere, are discharged therewith through said opening and into said enclosure in the path of said gas stream and are then released by

change of state of the ice crystals, and means located in the path of said gas stream downstream of said opening for electro-



statically precipitation said particles following charging thereof by said ions.

4,544,383

HORIZONTAL FLOW ELECTROSTATIC PRECIPITATOR WITH GAS DISTRIBUTOR RECEIVING DOWNWARD GAS FLOW

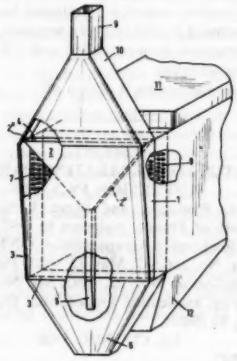
Karl Haselmaker, Maintal, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 570,008

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300859

Int. Cl.⁴ B03C *3/01, 3/36*

U.S. Cl. 55—129 **10 Claims**



1. A combination of a horizontal-flow electrostatic precipitator having a first inlet for a gas to be cleaned of rectangular configuration lying substantially in vertical plane and a diverting and distributing device for feeding vertically downwardly arriving gas to said first inlet, said device comprising:

a downwardly divergent diffuser having a second inlet for receiving said gas and disposed adjacent said first inlet;

a housing constructed to define a downwardly convergent inlet passageway connected to said diffuser and receiving said gas therefrom, said housing being open laterally in the direction of said first inlet and in flow communication therewith over the entire cross-section thereof;

means forming a preliminary dust-accumulating bin below said housing and connected thereto; and

a partition within said housing and in said passageway constructed and arranged to from two flow cross sections subdividing the interior thereof into an upper flow cross section open laterally over only an upper portion of said first inlet, and a flow cross-section around said upper cross section opening into the remainder of said first inlet, thereby compelling a portion of the gas to flow through the upper portion of said first inlet.

4,544,384

ADSORBER FOR TWO-COMPONENT RECOVERY AND METHOD OF OPERATING SAME

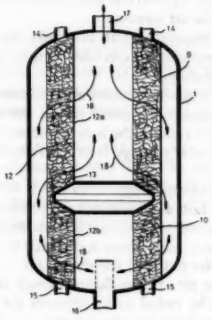
Michael Metschl, Munich; Hannsjörg Koch, Wolfratshausen, and Wilhelm Rohde, Munich all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 555,188

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243656

Int. Cl.⁴ B01D *53/06*

U.S. Cl. 55—180 **2 Claims**



2. An adsorber for the selective removal of two components from a multicomponent gas stream to be treated comprising:

an upright housing;

a first adsorber bed in said housing positioned to be traversed by said gas stream to be treated;

a second adsorber bed in said housing spaced from said first bed and traversed by said gas stream subsequent to its traversal of said first bed;

fittings on said housing for passing said gas stream to be treated and a regenerating gas through said beds; and

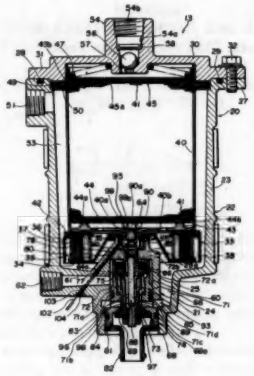
means for holding at least one of said beds in an upright orientation so that said gas stream and said generating gas traverse said one of said beds substantially horizontally, said beds being composed respectively of an adsorbent trapping a component which upon regeneration is released at least in part in a liquid form and an adsorbent trapping a component which upon regeneration is released in gaseous form, said one of said beds being said second adsorber bed and said second adsorber bed upon regeneration releasing a respective trapped component in gaseous form, said other of said beds being an upright bed traversed horizontally by said gas stream and said generating gas, both of said beds being cylindrical of annular cross section and axially aligned with one another along a common axis, said beds being separated by a partition, said partition being frustoconical and having a half angle corresponding to the maximum flow angle of the adsorbent of the bed therebelow, said partition defining a gap enabling flow of adsorbent from the upper bed to the lower bed.

4,544,385

AIR DRYER DEVICE FOR COMPRESSED AIR SYSTEM OF VEHICLE

Masakatsu Tanaka, Yokosuka, Japan, assignor to Nippon Air Brake Co., Ltd., Japan

Filed Jul. 31, 1984, Ser. No. 636,416
Claims priority, application Japan, Sep. 13, 1983, 58-142134[U]
Int. Cl.[4] B01D *53/00, 45/16*
U.S. Cl. 55—208 5 Claims



1. An air dryer device for a compressed air system of a vehicle, said compressed air system having a compressor for supplying suppressed air, an air reservoir for restoring the compressed air and an air governor for feeding a pneumatic signal, said air dryer device comprising:

(a) a housing;

(b) a dryer mounted within said housing and containing a desiccant for drying the compressed air from the compressor, said dryer being connectable to the air reservoir for feeding the dried compressed air thereto;

(c) a drain valve mounted within said housing, said drain valve including (i) a valve body having a valve port and a valve seat disposed adjacent to said valve port, (ii) a hollow elongated control piston mounted within said valve body for movement along an axis thereof, said control piston having a bore extending along its axis (iii) a valve element mounted on said control piston, and (iv) means for normally urging said valve element into sealing engagement with said valve seat to close said valve port, said control piston being responsive to the pneumatic signal from the air governor for being moved along its axis to bring said valve element out of sealing engagement with said valve seat to open said drain valve, thereby communicating the interior of said housing with the atmosphere; and

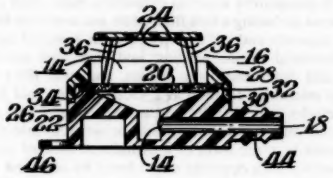
(d) an elongated heater member mounted at one end thereof on said valve body for generating heat, said heater member being received in said bore of said control piston, the other end of said heater member being disposed close to said valve element to transmit the heater of said heater member to said valve element and said valve seat, a projection being formed on the inner surface of said bore of said control piston adjacent to said valve element, and said heater member engaging said projection and being spaced from said inner surface of said bore.

4,544,386

FILTER CASSETTE

Charles Trayford, III, and Jeffrey M. Petrizzi, both of Wilmington, Del., assignors to Environmental Safety Products, Inc., Wilmington, Del.

Filed May 23, 1983, Ser. No. 496,825
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—270 14 Claims



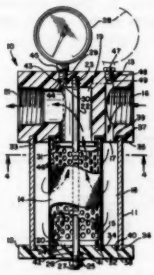
1. A filter cassette for the sampling of airborne substances which comprises a body section having an outside surface and an air flow passageway extending through the body section from an air inlet to an air outlet, a filter medium inside the body section disposed across the air flow passageway for capturing airborne substances flowing through the passageway, the passageway portion directly downstream from the filter medium having a uniform frusto-conical contour converging in the direction of flow and the passageway portion downstream from the uniform frusto-conical contour being centrally positioned relative to the filter medium, and the air inlet comprising openings in the body section extending through the outside surface thereof upstream from the filter medium arranged to direct air into the air flow passageway normal to the direction of flow onto the filter medium.

4,544,387

OUTER TO INNER FLOW VACUUM FILTER WITH SEE THROUGH OUTER ENCLOSURE

Charles G. Agerlid, 8634 Banff Dr., Dallas, Tex. 75243

Continuation-in-part of Ser. No. 534,413, Sep. 21, 1983, abandoned. This application Jan. 25, 1985, Ser. No. 694,856
Int. Cl.[4] B01D *29/04, 29/16*
U.S. Cl. 55—274 18 Claims



1. An in-line vacuum filter useable in a vacuum system between a vacuum pump and a vacuum packaging machine to block flow of process debris and sediment to the vacuum pump comprising: filter element means; an outer enclosure; with said outer enclosure and said filter element means defining an outer chamber; filter plate means closing an end of said outer chamber; air inlet and passage means in said filter plate means in fluid communication with said outer chamber whereby vacuum system air is drawn through said air inlet means and through said passage means into said outer chamber; an inner

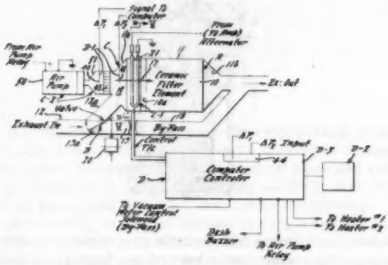
space chamber defined by said filter element means and with said filter plate means closing an end of said inner space chamber; vacuum air outlet and passage means in said filter plate means in fluid communication with said inner chamber whereby vacuum system air is sucked from said inner space chamber when the vacuum pump of the system is drawing a vacuum; and with said outer enclosure including transparent material wall means whereby an operator may visually see process debris and sediment buildup on the outer surface of said filter means; wherein said outer enclosure means is in the form of a transparent material cylindrical tube; with said filter plate means including a first filter plate and a second filter plate closing opposite ends of said transparent material cylindrical tube; structural means holding said first and second filter plates, said outer enclosure means, and said filter element means in assembled relation as a vacuum filter; said first filter plate includes said air inlet and passage means and also said vacuum air outlet and passage means; wherein said filter element means is in the form of a cylindrical tube of air passing filter material with opposite ends closed by said first and second filter plates; said first filter plate and said second filter plate are provided with facing planar surfaces with concentric annular grooves for mounting of said outer enclosure means, and said filter element means assembled in concentric relation about said structural means as a vacuum filter; and wherein ends of said filter element means are received in annular grooves in said first and second filter plates of less diameter than said annular grooves receiving ends of said outer enclosure; and seal means in the form of "O" ring seals seal the interconnect of the ends of said outer enclosure with said first and second filter plates from the bypass drawing of outside air into the vacuum filter; with the "O" ring seals mounted in annular branch grooves in the inner walls of said annular grooves mounting said outer enclosure means with said "O" ring seals in position to seal space between branch groove edges and the inside of the transparent outer cylindrical enclosure at opposite ends thereof when a vacuum is drawn in the filter; and with said "O" ring seals relatively loose in the relaxed state facilitating repeated filter disassembly and reassembly yet subject to being drawn into the sealing state when a vacuum is drawn in the filter.

4,544,388

APPARATUS FOR PERIODICALLY OXIDIZING PARTICULATES COLLECTED FROM EXHAUST GASES

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County, and Wallace R. Wade, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1983, Ser. No. 573,277
Int. Cl.[4] B01D *39/20, 46/42;* **F01N** *3/02, 3/10*
U.S. Cl. 55—282 **14 Claims**



1. An apparatus for regenerating a filter trap used to collect particulates from the exhaust gas of an internal combustion engine, comprising:

(a) first means for providing a flow of an oxygen carrying heat transfer medium to and through a filter trap containing particulates;

(b) second means for heating the heat transfer medium in said first means to a temperature effective to ignite at least one portion of said particulates to permit incineration of the remainder of said particulates; and

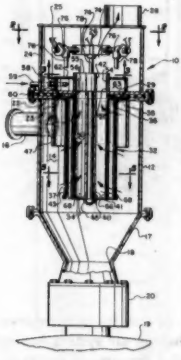
(c) a flow mask stationed in said first means so as to provide a flow of heat transfer medium to a filter trap downstream from said means for heating the heat transfer medium, said mask being constructed and arranged such as to divert the heated heat transfer medium away from the radially inner zone of such filter trap and thereby guide said heated heat transfer medium to engage and ignite particulates along a radially outer zone of the filter trap.

4,544,389

MULTIPLE JET BACKFLUSHED AIR FILTER

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Filed Nov. 7, 1983, Ser. No. 549,963
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—302 **17 Claims**



1. A porous media barrier type air filter unit, said filter unit including:

a housing forming a filter chamber and including means for conducting dust laden air into said filter chamber and means for conducting filtered air from said housing;

a filter element disposed in said filter chamber;

means for supporting said filter element in said filter chamber, said filter element being constructed and arranged so as to define at least in part a clean air chamber for receiving air being filtered and which has flowed through said filter element;

means forming a flow tube opening into said clean air chamber for conducting air which has been filtered from said clean air chamber and away from said filter element;

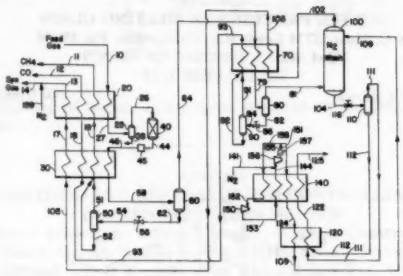
a divider structure disposed in said clean air chamber and including means for partitioning said clean air chamber into a plurality of separate subchambers; and

reverse flow air jet nozzle means comprising a plurality of separate orifices arranged in a predetermined pattern for discharging a shaped jet of pressure air for contact with substantially the entire periphery of the walls of said flow tube and for inducting a relatively large volume of substantially ambient pressure air into said flow tube in a direction opposite to the normal direction of flow of air which has been filtered out of said clean air chamber to backflush said filter element with a quantity of combined induced and jetted pressure air, said nozzle means being arranged in such a way so as to generate a jet having a cross sectional shape conforming to the cross sectional shape of said subchambers, respectively.

4,544,390
CRYOGENIC PRODUCTION OF AMMONIA SYNTHESIS GAS

Daniel Traficante, Boonton, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 465,840, Feb. 14, 1983,. This application Feb. 23, 1984, Ser. No. 582,915
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—20 **18 Claims**



1. A process for producing a hydrogen-rich gas substantially free of carbon monoxide and methane which comprises:

(a) cooling a hydrogen-containing raw gas stream, containing hydrogen as a main constituent together with carbon monoxide and methane, in a first heat exchange zone to condense at least a major portion of said methane;

(b) recovering and expanding said methane-containing condensate and returning the resulting cooled methane-containing vapor and liquid to said first heat exchange zone to cool additional quantities of said raw gas stream;

(c) further cooling said cooled raw gas stream, now depleted in methane, in a second heat exchange zone to condense at least a major portion of said carbon monoxide therefrom and to form a treated hydrogen gas stream containing low levels of carbon monoxide and methane;

(d) recovering and expanding said carbon monoxide-containing condensate and serially passing the resulting cooled carbon monoxide gas and liquid to said second heat exchange zone and thence to said first heat exchange zone to provide at least a portion of the cooling medium passed to said zones;

(e) contacting said treated hydrogen gas stream in a nitrogen wash tower with liquid nitrogen to remove essentially all of said remaining carbon monoxide and methane therefrom, thereby forming a liquid bottoms product containing nitrogen and said removed carbon monoxide and methane impurities, and an overhead product comprising said hydrogen-rich gas containing hydrogen and nitrogen and substantially free of carbon monoxide and methane; and

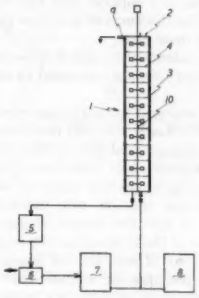
(f) expanding said liquids bottoms product and passing the resulting cooled vapor and liquid as cooling medium to a third heat exchange zone to which is also fed a nitrogen gas feedstream, wherein said nitrogen in said feedstream is liquefied to form said liquid nitrogen for use as feed to said nitrogen wash tower.

4,544,391
METHOD FOR SEPARATION OF SOLID MIXTURES BY SIMULTANEOUS MULTI-STAGE RECRYSTALLIZATION

Hiroshi Oka, Kawasaki, Japan, assignor to Kohjin Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,513
Int. Cl.[4] B01D *9/02*
U.S. Cl. 62—541 **5 Claims**

1. A method for separating a substance from a mixture of solid substances which comprises: (1) intermittently and countercurrently feeding both (i) a raw material in the form of a mixture of solid substances to one end portion of a plate tower and (ii) a solvent to the other end portion of the plate tower, said plate tower being divided into chambers by separation plates suitable for separating a precipitate from a liquid, (2) conducting a continuous multi-stage recrystallization after each of said feeding, said multi-stage recrystallization consisting of the following sequence of steps: (a) heating the solvent

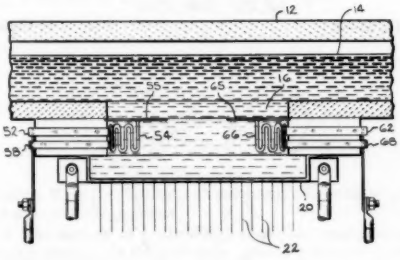


in each chamber to dissolve the solid substances, (b) transferring the resulting solution in each chamber to the adjacent following chamber, (c) cooling the solution to precipitate a desired substance and (d) transferring the resulting mother liquor in each chamber to the adjacent prior chamber, and (3) taking out the desired substance with the solvent from the chamber positioned on the solvent feeding side and taking out the undesired substances with the solvent from the chamber positioned on the raw material feeding side.

4,544,392
APPARATUS FOR THERMALLY CONDITIONING HEAT SOFTENABLE MATERIAL

Isac M. Sheinkop, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jun. 29, 1984, Ser. No. 626,171
Int. Cl.[4] C03B *37/09*
U.S. Cl. 65—1 **1 Claim**



1. A bushing block with auxiliary heaters for the outlet of a glass melting furnace comprising:

(a) a first heater having a first formed bus bar connected to a first serpentine resistance heating element, said first serpentine resistance heating element being connected to a flow path, said flow plate being connected to a second serpentine resistance heating element, said second serpentine resistance heating element connected to a second formed bus bar;

(b) a first refractory support being generally rectangular in shape having a first recess of a depth not less than one half the thickness of the first formed bus bar said first recess

running laterally across the face of said refractory support to position said first formed bus bar, a second recess having a depth of at least one half the thickness of the second formed bus bar said second recess running laterally across the face of said refractory support below said first recess to position said second formal bus bar, a centrally located cavity in said first refractory support opening toward the face thereof with arcuately formed ends to accept the serpentine resistance heating elements, a recess in the top of said first refractory support said top recess having a depth of at least the thickness of said flow plate to position and restrain said flow plate;

(c) a second heater identical to said first heater;

(d) a second refractory support identical to said first refractory support;

(e) said first heater and said second heater positioned on said first refractory block wherein said first formed bus bar of said first heater engages said first recess in the face of said first refractory support, said first formed bus bar of said second heater engages said first recess of said first refractory support on the opposite side thereof, said second formed bus bar of said first heater engages said second recess in the face of the first refractory support, said second formed bus bar of said second heater engages said second recess in the opposite side of said first refractory support, said flow plate of said first heater engages the recess in the top of said first refractory support, said flow plate of said second heater engaging the recess in the top of said first refractory support;

(f) said second refractory support positioned face to face coextensive with said first refractory support positioning said first heater and said second heater between said first refractory support and said second refractory support forming a non-circular opening in the center thereof to encircle the serpentine heater elements;

(g) a first adjustable electrical power supply connected to said first formed bus bar and said second formed bus bar of said first heater; and

(h) a second adjustable electrical power supply connected to said first formed bus bar and said second formed bus bar of said second heater.

4,544,393

ROTARY FIBER FORMING METHOD AND APPARATUS

Roger J. Bilen, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 22, 1984, Ser. No. 612,774

Int. Cl.[4] C03B *37/04*

U.S. Cl. 65—6 **11 Claims**

6. A method for centrifugal production of fibers comprising rotating a spinner adapted with an orificed peripheral wall to centrifuge streams of molten material, and attenuating said streams into fibers with an annular blower surrounding said spinner by directing gas flows from openings in said blower, said gas flows being directed generally parallel to the axis of rotation of said spinner, but having a component in the tangential direction with respect to said peripheral wall, the component being opposite the direction of rotation of said spinner, and the gas flows being at an angle to said axis within the range of from about 2 degrees to about 45 degrees, and increasing the turbulence in a locus radially outward from and beneath said spinner by rotating one or more turbulence generating members beneath said spinner, said turbulence generating members being concave in the direction of rotation of said spinner.

4,544,394

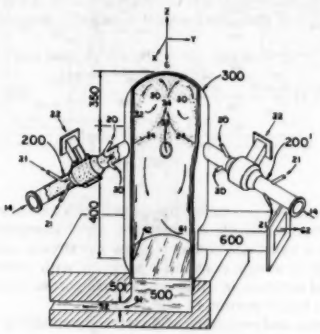
VORTEX PROCESS FOR MELTING GLASS

James G. Hnat, 3774 Lewis Rd., Collegeville, Pa. 19426

Filed Mar. 5, 1984, Ser. No. 585,979

Int. Cl.[4] C03B *5/14*

U.S. Cl. 65—27 **20 Claims**



1. A method of melting glass in a vortex reactor comprising the steps of:

heating first glass batch material;

mixing said heated first glass batch material with second glass batch material, whereby a glass material mixture is created;

introducing said mixture into said vortex reactor;

introducing fuel and oxidant into said vortex reactor concurrent with the introduction of said mixture;

said introductions of mixture and fuel and oxidant being done in such a manner as to produce a vortex flow in said reactor and to disperse said glass batch materials to the walls of said reactor; and

combusting said fuel within said reactor in the presence of said glass batch material mixture, whereby the interior of said reactor and the mixture therein are heated and whereby said glass batch materials comprising said mixture collide with each other and the walls of said reactor thereby forming molten glass layer on said reactor walls.

4,544,395

CATIONIC SURFACE COATING OF FLAT GLASS

Brian Evans, Formby, England, assignor to Pilkington Brothers Limited, England

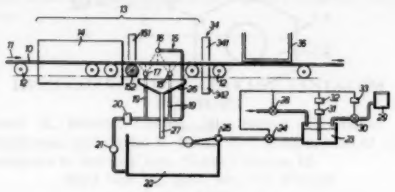
Continuation of Ser. No. 67,501, Aug. 17, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,923

Int. Cl.[4] C03C *17/28*

U.S. Cl. 65—60.3 **23 Claims**

1. A method for treating flat glass to reduce its vulnerability to scratching which comprises the steps of advancing the glass along a production line on which the glass has been made to a treatment station forming part of the production line, applying an aqueous solution which consists of a cationic surface active agent to at least one major surface of the glass at the treatment

station, and thereafter removing the glass from the treatment station and drying the glass so as to leave a transparent film



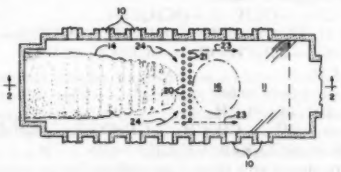
consisting of surface active agent adsorbed on the glass surface.

4,544,396

METHOD AND APPARATUS FOR CONTROLLING CURRENTS IN GLASS MELTER

John F. Krumwiede, Indiana Township, Allegheny County; William C. Harrell, Buffalo Township, Butler County; William G. Hilliard, Lower Burrell, all of Pa., and James E. Harris, Wichita Falls, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 20, 1983, Ser. No. 543,735
Int. Cl.⁴ C03B *5/16*
U.S. Cl. 65—178 **8 Claims**



1. A method of melting glass comprising feeding a layer of glass batch materials onto a pool of molten glass at an upstream end of a furnace, withdrawing molten glass at a downstream end of the furnace longitudinally spaced from the upstream end, providing heat to the furnace above the pool of molten glass so as to melt the glass, whereby a zone of rising glass currents is established in the pool between the downstream end of the batch layer and the downstream end of the furnace, on the upstream side of the zone injecting gas into the molten glass at a plurality of locations in a first transverse row and at a plurality of locations in a second transverse row, the second transverse row being downstream from the first transverse row, and the injection of gas in the second downstream row being at a higher elevation than that in the first row, whereby gas is injected into the same stream portion of glass by the first and second rows so as to enhance the rising currents.

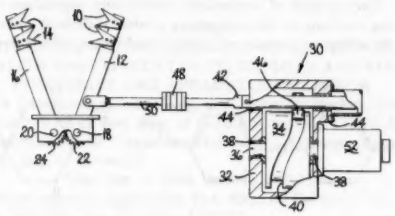
4,544,397

FEEDER MECHANISM FOR SUPPLYING GOBS OF PLASTIC MATERIAL

Frank A. Fenton, Wheatley, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 5, 1983, Ser. No. 510,866
Claims priority, application United Kingdom, Jul. 9, 1982, 829985
Int. Cl.⁴ C03D *11/00*
U.S. Cl. 65—332 **11 Claims**

1. An improved feeder mechanism for supplying gobs of plastic material, e.g. molten glass, of the type including a plunger driving means operable to move a plunger into and out of an opening in the bottom of a channel containing the plastic material so that, when the plunger is out of the opening, the plastic material flows out through the opening, and apparatus for shearing gobs from the material flowing out through the opening, the apparatus including a set of shears blades movable towards and away from one another between open and shearing positions thereof, and a driving system arranged to drive the shear blades, wherein the improvement comprises an improved driving system for the shear blades comprising a link connected to the shear blades and mounted for linear movement to move the shear blades as aforesaid, a cam mounted for



rotation about a central axis thereof, the cam having a cam track, a cam follower mounted on the link and engaging the cam track so that rotation of the cam about its axis causes linear movement of the link, wherein the cam is arranged to be driven about its axis by a servomotor at a speed which is varied in accordance with control signals to move the shear blades in accordance with a desired position against time curve between limits defined by the shape of the cam track.

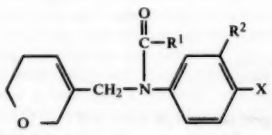
4,544,398

N-CARBONYL-N-(5,6-DIHYDRO-2H-3-PYRANYLMETHYL)-4-HALOANILINES AS HERBICIDES

Teresa M. Tam, Vallejo, and Don R. Baker, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

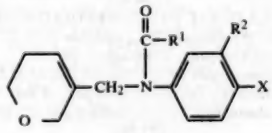
Filed Dec. 15, 1983, Ser. No. 561,851
Int. Cl.⁴ A01N *43/30;* **C07D** *309/22*
U.S. Cl. 71—88 **8 Claims**

1. A compound having the structural formula



wherein R^1 is C_1–C_4 alkyl or cyclopropyl; R^2 is hydrogen or chlorine and X is halogen.

5. The method of controlling undesirable vegetation comprising applying to the area were control is desired, an herbicidally effective amount of a compound having the formula



wherein R^1 is C_1–C_4 alkyl or cyclopropyl; R^2 is hydrogen or chlorine and X is chlorine, bromine, or iodine.

4,544,399

CERTAIN 1,3-CYCLOHEXANEDIONE ADDUCTS OF SUBSTITUTED PHENOXYPHENOXYPROPIONIC ACIDS AND THEIR USE AS AN HERBICIDE

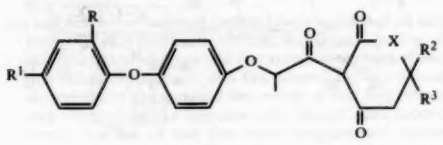
David L. Lee, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 510,141, Jul. 1, 1983, Pat. No. 4,482,727. This application Jul. 20, 1984, Ser. No. 605,529

Int. Cl.[4] **A01N** *43/00, 35/00*

U.S. Cl. 71—88 **6 Claims**

1. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein R is hydrogen or halogen, R^1 is halogen, R^2 is hydrogen or trifluoromethyl or C_1–C_4 alkyl, R^3 is hydrogen or C_1–C_4 alkyl, and X is oxygen or methylene.

4,544,400

COMPOSITIONS

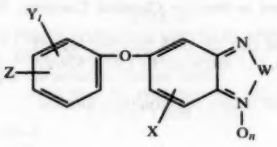
Richard J. Anderso[illegible]alo Alto, and Michael M. Leippe, Boulder Creek, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 351,070, Feb. 22, 1982, abandoned. This application Jul. 18, 1983, Ser. No. 514,749

Int. Cl.[4] **C07D** *271/08, 285/10;* **A01N** *43/26*

U.S. Cl. 71—90 **16 Claims**

1. A compound of the formula:



(A)

wherein,

n is zero or one;

t is one or two;

W is sulfur;

X is hydrogen, halogen or nitro; and

each of Y and Z is independently selected from lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, halogen, cyano, nitro or amino.

4,544,401

AGRICULTURAL PYRIDINESULFONAMIDES

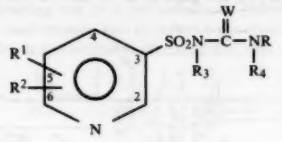
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 83,753, Oct. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,258, Dec. 4, 1978, abandoned. This application Jan. 22, 1981, Ser. No. 227,243

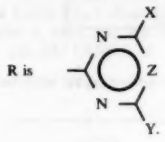
Int. Cl.[4] **A01N** *43/54;* **C07D** *239/28, 239/30*

U.S. Cl. 71—92 **26 Claims**

1. A compound of the formula:



wherein



R_1 is H, Cl, Br, F, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, $COOR_5$, NR_6R_7 or $SO_2NR_{10}R_{11}$;

R_2 is H, Cl, Br or CH_3;

R_3 and R_4 are independently H or CH_3;

R_5 is C_1–C_6 alkyl, C_3–C_6 alkenyl, $CH_2CH_2OCH_3$, $CH_2CH_2OCH_2CH_3$, $CH_2CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_6 and R_7 are independently CH_3 or CH_3CH_2;

R_6 and R_7 can be taken together to form $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R_{10} and R_{11} are independently CH_3 or CH_3CH_2;

W is oxygen or sulfur;

X is CH_3, $—OCH_3$ or $—OCH_2CH_3$;

Y is H, Cl, CH_3, CF_3, $—NHCH_3$, $—N(CH_3)_2—$, $—CH_2OR_8$, $—CH_2CH_2OR_8$, $—OCH_2CF_3$ or VR_9;

Z is CH;

V is oxygen or sulfur;

R_8 is CH_3 or CH_3CH_2; or

R_9 is CH_3, CH_3CH_2, $CH_2CO_2R_8$, $CH_2CH_2OR_8$, $C(CH_3)HCO_2R_8$ or $CH_2CH_2CO_2R_8$;

and agricultural salts thereof; providing that:

R_1 is at the 2- or 4-position of the pyridine ring.

4,544,402

4-DL-ALKYLESTER-α-ALANINYL-6-CHLORO-S-TRIAZINES AND THE USE THEREOF AS HERBICIDES

Horst Schnurbusch, Herne, and Helmut Baltruschat, Nottuln, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

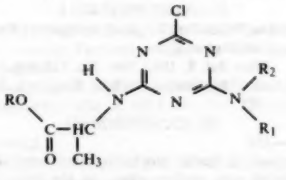
Filed May 24, 1984, Ser. No. 613,781

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322720

Int. Cl.[4] **C07D** *251/50;* **A01N** *43/70*

U.S. Cl. 71—93 **10 Claims**

1. A method of selectively treating useful plant crops against weeds and harmful grasses before germination of the seeds, after germination of the seeds or before and after germination of the seeds which comprises applying one or more 4-DL-alkyl ester-α-alaninyl-6-chloro-s-triazines having the formula (1):



wherein R_1 is a radical having not more than 10 carbon atoms selected from the group of straight or branched chained alkyl, alkoxy, alkoxyalkyl or alkylol radicals which are unsubstituted, or which are substituted by a cyclopentyl or cyclohexyl

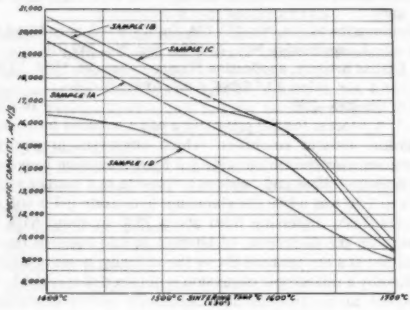
group, which is itself, unsubstituted or substituted by up to five methyl groups; R_2 is a radical from the group of alkyl radicals of 1 to about 3 carbon atoms, or a hydrogen atom; and R is a radical from the group of alkyl radicals of 1 to about 3 carbon atoms.

4,544,403

HIGH CHARGE, LOW LEAKAGE TANTALUM POWDERS

Edward K. Schiele, Gurnee, Ill.; Robert V. Manley, Jr., Muskogee, and Carlos F. Rerat, Fort Gibson, both of Okla., assignors to Fansteel Inc., North Chicago, Ill.

Filed Nov. 30, 1984, Ser. No. 676,666
Int. Cl.[4] B22F *9/00*
U.S. Cl. 75—0.5 AB **25 Claims**



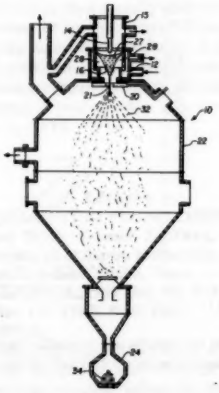
1. A tantalum powder for electrodes in elctrolytic capacitors with improved specific capacity and low direct current leakage containing a total added carbon plus nitrogen plus sulfur content in an amount from about 100 to 10,000 ppm total contained C+N+S, with a minimum sulfur content of 50 ppm on a tantalum metal weight basis.

4,544,404

METHOD FOR ATOMIZING TITANIUM

Charles F. Yolton, Coraopolis, and John H. Moll, Pittsburgh, both of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1985, Ser. No. 710,806
Int. Cl.[4] B22D *23/08*
U.S. Cl. 75—0.5 C **19 Claims**



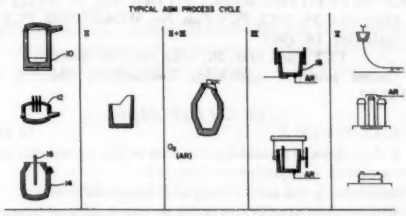
1. A method for producing titanium particles suitable for powder metallurgy applications, said method comprising producing a molten mass of titanium in a crucible having therein a nonoxidizing atmosphere, maintaining said molten mass of titanium out-of-contact with said crucible, producing a free-falling stream of said molten titanium from said crucible, striking said free-falling stream with an inert gas jet to atomize said molten titanium to form spherical particles, cooling said spherical particles to solidify said particles and collecting said solidified particles.

4,544,405

METHOD OF PRODUCING STEELS OF GREAT PURITY AND LOW GAS CONTENT IN STEEL MILLS AND STEEL FOUNDRIES AND APPARATUS THEREFOR

Ulrich Glasmeyer, Freudenberg, and Horst Willaschek, Oberhausen, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,024
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331710; Dec. 31, 1983, 3346718
Int. Cl.[4] C21C *7/00*
U.S. Cl. 75—51.2 **20 Claims**



1. A method for producing steels of high purity and low gas content in steel mills and steel foundries, comprising:
melting the steel to form molten steel;
tapping the molten steel into a converter;
adding alloying additives to the molten steel;
decarburizing the molten steel plus alloying additives by directing an inert gas, air and oxygen mixture into the convertor in at least one stage;
deoxidizing the molten steel plus alloying additives by intensely flushing the molten steel plus alloying additives with an inert gas, said deoxidizing taking place during said at least one stage and resulting in the formation of slag containing deoxidizing substances;
tapping the molten steel with alloying additives and slag into a ladle that is lined with a refractory material; and
fine flushing the molten steel plus alloying additives and slag in the ladle.

4,544,406

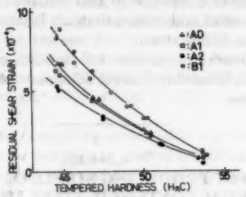
SPRING STEEL HAVING A GOOD SAG-RESISTANCE AND A GOOD HARDENABILITY

Toshiro Yamamoto, Tokai; Ryohei Kobayashi, Chita; Mamoru Kurimoto, Tokonabe, and Toshio Ozone, Nagoya, all of Japan, assignors to Aichi Steel Works, Ltd., Tokai and Chuo Hatsujo Kabushiki Kaisha, Nagoya, both of, Japan

Filed Aug. 6, 1982, Ser. No. 405,802
Claims priority, application Japan, Nov. 8, 1981, 56-126280
The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.
Int. Cl.[4] C22C *38/26, 38/12*
U.S. Cl. 75—123 N **8 Claims**

1. A spring steel having a good sag-resistance and a good hardenability consisting essentially of by weight 0.5–0.8%

carbon, 1.5–2.5% silicon, 1.6–2.5% manganese and a member or members selected form a group consisting of 0.05–0.5%



vanadium, 0.05–0.5% niobium and 0.05–0.5% molybdenum, the remainder being iron together with impurities.

4,544,407

PROCESS FOR PRODUCING CAST IRON CASTINGS WITH A VERMICULAR GRAPHITE STRUCTURE

Reinhold Linkert, Hilzingen, Fed. Rep. of Germany; Emil Becker, Flurlingen, and Horst Hoffmann, Schaffhausen, both of Switzerland, assignors to George Fischer Aktiengesellschaft, Switzerland

PCT No. PCT/CH82/00050, § 371 Date Nov. 29, 1982, § 102(e) Date Nov. 29, 1982, PCT Pub. No. WO82/03410, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 30, 1982, Ser. No. 449,008

Claims priority, application Switzerland, Mar. 3, 1981, 2158/81

Int. Cl.⁴ C22C *33/08*

U.S. Cl. 75—130 A **21 Claims**

1. A process of producing cast iron with a vermicular graphite structure, comprising the steps of:

determining the ratio of Mg to S in the melt; and

adjusting the Mg/S ratio of the melt to a value of from about 0.8 to about 2.5.

4,544,408

THIXOTROPIC ALUMINA COATING COMPOSITIONS, PARTS AND METHODS

Mark F. Mosser, Sellersville, and Kevin Eddinger, Gilbertsville, both of Pa., assignors to Sermatech International Inc., Limerick, Pa.

Filed Apr. 18, 1983, Ser. No. 485,748

Int. Cl.⁴ C09D *5/08*

U.S. Cl. 106—14.12 **29 Claims**

1. A stable thixotropic coating composition for improved resistance to atmospheric and corrosive conditions, which composition is especially suitable for dipspin application which comprises (a) an aqueous acid coating solution which solution comprises phosphate ions and ions of the group consisting of chromate ions or molybdate ions, and (b) a hydrated alumina having a boehmite type crystal lattice dispersed in an acid solution containing a monoprotic acid.

4,544,409

COATING FOR PROTECTING CONSTRUCTIONS, PARTICULARLY AGAINST HEAT AND FIRE

Jean-Charles Daussan; Gérard Daussan, both of Metz, and André Daussan, Longeville les Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Continuation of Ser. No. 448,192, Dec. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 230,963, Jun. 4, 1980, abandoned. This application Oct. 5, 1984, Ser. No. 658,062

Claims priority, application France, Jun. 5, 1979, 7914285

Int. Cl.⁴ C09D *5/16*

U.S. Cl. 106—18.14 **4 Claims**

1. A coating for protecting structures against fire and heat, containing by weight percent

a cement selected from the group consisting of aluminous and Portland cements and mixtures thereof:	10 to 80%
hydrated trisodium phosphate ($Na_3PO_4.12H_2O$):	5 to 20%.

4,544,410

PROCESS FOR THE PRODUCTION OF AN AQUEOUS BITUMINOUS PREPARATION

Béláné Karácsonyi née Éva Spindler, 1089, Benyovszky M.u.19; Béla Rácz, 1121, Cinege ut 8/b; István Böszörményi, 1182, Boja ut 11.; László Király, 1012, Attila ut 79., and András Medgyesi, 1025, Nagybányai ut 78/c, all of Budapest, Hungary

Continuation of Ser. No. 403,234, Jul. 29, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 549,018

Claims priority, application Hungary, Jul. 30, 1981, 2224/81

Int. Cl.⁴ C08K *5/01;* **C08L** *95/00*

U.S. Cl. 106—278 **10 Claims**

5. A process for the production of an aqueous bitumen dispersion without emulsifier, which comprises preparing an aqueous aluminum hydroxide gel by the reaction in water of aluminum sulfate and calcium hydroxide in a weight ratio of 1:3 to 1:10 and while the aluminum hydroxide gel is still relatively fresh, dispersing from about 35% to about 65% (wt) based on the dispersion, of bitumen in said aqueous reaction mixture at a temperature above the softening point of bitumen, whereby a thixotropic dispersion is obtained that is stable with respect to electrolytes and chemically active construction materials.

4,544,411

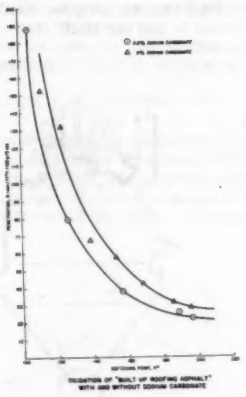
METHOD AND COMPOSITION OF ASPHALTIC ROOFING FLUXES

Robert H. Wombles, Worthington; Donald D. Carlos, Louisville, and Charles R. Gannon, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 16, 1984, Ser. No. 580,968

Int. Cl.⁴ C08L *95/00;* **C10C** *3/04*

U.S. Cl. 106—279 **25 Claims**



2. A process for producing a satisfactory asphaltic roofing flux from an unsatisfactory asphaltic roofing flux, said process comprisihg:

(a) determining the amount of asphaltenes, polars and saturates present in said unsatisfactory flux;

(b) determining the amount of asphaltenes, polars and saturates in an additive selected from the group consisting of deasphalted oils, slack waxes, petrolatums, a hydrocarbyl species, cylinder stock and mixtures thereof;

(c) compounding a sufficient quantity of from 0 to 20% by weight as based upon the total weight of said satisfactory asphaltic flux, of asphaltenes to provide a stable dispersion, and a sufficient quantity of said additive so that:

(A+P)/(S) is a weight ratio less than about 2.4; wherein:

A is the weight of asphaltenes in the flux;

P is the weight of polars in the flux;

S is the weight of saturates in the flux.

4,544,412
DEPOSITION OF IMPROVED SIC COATINGS ON CARBON-BASE MATERIALS

Richard D. Veltri, East Hartford, and Francis S. Galasso, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 391,613, Jun. 24, 1982, Pat. No. 4,476,164. This application Jun. 1, 1984, Ser. No. 616,089

Int. Cl.⁴ C09D *1/00*

U.S. Cl. 106—286.5 **1 Claim**

1. An improved pack material for the formation of SiC coatings on carbon-base materials consisting essentially of about:

about 60% SiC powder,

about 30% Si powder,

about 1% B powder,

about 9% Al_2O_3 powder.

4,544,413
SOLUTION FOR CLEANING AND PRESERVING PLASTIC AND METALLIC SURFACES

Byron R. Boots, 26102 Eden Landing Rd., Ste. 3, Hayward, Calif. 94545, and Buong P. Lau, 1201 E. Herndon Ave., Fresno, Calif. 93710

Continuation of Ser. No. 295,415, Aug. 24, 1981, abandoned. This application Mar. 15, 1984, Ser. No. 589,978

Int. Cl.⁴ C08K *5/02, 5/05;* **C08L** *83/04*

U.S. Cl. 106—287.14 **1 Claim**

1. A solution for cleaning and preserving plastic and metallic surfaces comprising: a solvent including anhydrous isopropanol; a vinyl benzylamine functional silane; halogenated hydrocarbons; and a silicone including dimethylsiloxane polymer in solution with the solvent and the silane, the silane and the silicone being operable to form a protective layer on a surface when the solution is applied thereto, said solvent being in the solution at a volume of approximately 775 parts per 1000, said silane being in the solution at a volume of approximately 10 parts per 1000, said halogenated hydrocarbons being in the solution at a volume of approximately 200 parts per 1000, and said silicone being in said solution at a volume of approximately 15 parts per 1000.

4,544,414
SELF-EMULSIFYING SIZING COMPOSITION

Kimio Kawatani, Suita; Takashi Fujikawa, Kyoto, and Eiji Watanabe, Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

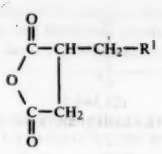
Filed Feb. 6, 1984, Ser. No. 576,987

Int. Cl.⁴ C09K *3/00;* **D21F** *11/00*

U.S. Cl. 106—287.24 **1 Claim**

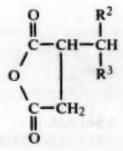
1. A self-emulsifying sizing composition comprising:

(A) at least one member selected from the group consisting of; a substituted succinic anhydride having a linear or branched substituent of the formula (I):



(I)

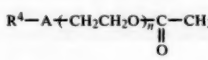
wherein R^1 is an alkyl or alkenyl group having 9 to 23 carbon atoms, and a substituted succinic anhydride of the formula (II):



(II)

wherein R^2 is an alkyl group having 1 to 27 carbon atoms, R^3 is an alkyl or alkenyl group having 2 to 28 carbon atoms and a total number of carbon atoms in R^2 and R^3 is 9 to 29, and

(B) at least one member selected from the group consisting of: an acetylated polyoxyethylene sorbitan fatty acid ester, and a polyoxyethylene compound of the formula (III):



(III)

wherein R^4 is an alkyl group having 8 to 20 carbon atoms, n is an integer from 3 to 30 and A is oxygen atom, phenyleneoxy group or

---

4,544,415
WEATHERING-RESISTANT PEARLESCENT PIGMENTS

Klaus-Dieter Franz, Kelkheim; Manfred Kieser, and Otto Stahlecker, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

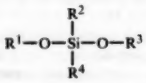
Filed Sep. 21, 1984, Ser. No. 653,127

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334598

Int. Cl.⁴ C09C *3/12;* **C09D** *17/00*

U.S. Cl. 106—288 R **20 Claims**

1. A pearlescent pigment having improved weathering resistance and comprising mica flakes coated with at least one metal oxide layer, and on top of the metal oxide layer(s), a topcoating comprising amounts of a compatible rare earth metal compound and a polysiloxane of the formula



wherein R^1 and R^3 are independently each

H, C_{1-4}-alkyl or poly-(C_{1-4}-alkylene) ether, and R^2 and R^4 are independently each

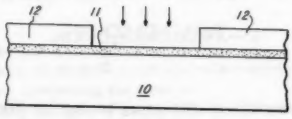
C_{1-4}-alkyl, C_{1-4}-alkylacrylic ester, C_{1-4}-alkylmethacrylic ester or poly-(C_{1-4}-alkylene) ether, effective to improve the weathering resistance of the pigment.

4,544,416

PASSIVATION OF SILICON OXIDE DURING PHOTORESIST BURNOFF

Charles G. Meador, and Eddie H. Breashears, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1983, Ser. No. 526,742
Int. Cl.⁴ H01L *21/306*; C23F *1/02*
U.S. Cl. 148—1.5 **7 Claims**



1. A method of manufacture of semiconductor devices comprising the steps of:

forming a layer of silicon oxide on a face of a semiconductor body,

applying a coating of photoresist on said face over said layer of silicon oxide,

exposing and developing said coating of photoresist to define a pattern then performing an operation on said face using such pattern as a mask,

and thereafter removing the remaining parts of said coating of photoresist by exposing said body to an atmosphere of oxygen and HCl at elevated temperature whereby the oxygen burns off the photoresist and chlorine freed by reaction of oxygen and HCl getters contaminants of the silicon oxide.

4,544,417

TRANSIENT CAPLESS ANNEALING PROCESS FOR THE ACTIVATION OF ION IMPLANTED COMPOUND SEMICONDUCTORS

Rowland C. Clarke, Penn Hills, and Graeme W. Eldridge, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1983, Ser. No. 499,083
Int. Cl.⁴ H01L *21/265, 21/324*
U.S. Cl. 148—1.5 **6 Claims**

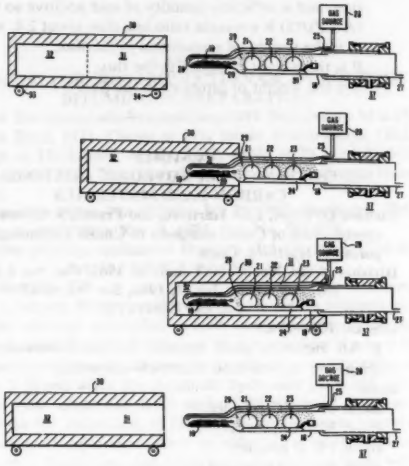
1. A method for activating and caplessly annealing a plurality of implanted gallium arsenide wafers disposed within an enclosed container on a volume production basis comprising the steps of:

heating dry crushed sacrificial gallium arsenide disposed within the enclosed container to a first temperature;

flowing hydrogen over said dry crushed sacrificial gallium arsenide to provide a gas mixture including gallium, arsenic and hydrogen;

flowing said gas mixture over said gallium arsenide wafers to be activated; and

heating said gallium arsenide wafers to be activated to a second temperature, with the first temperature in greater than the second temperature to maintain a gallium and



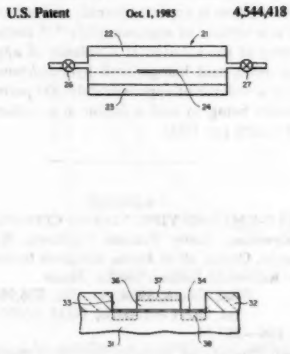
arsenic overpressure encompassing the wafers, said overpressure exceeding the decompositional pressure of the elements from the wafer and, terminating heating of both the sacrificial gallium arsenide and the wafer while maintaining flowing of the gas mixture over the wafer until the wafers are cooled.

4,544,418

PROCESS FOR HIGH TEMPERATURE SURFACE REACTIONS IN SEMICONDUCTOR MATERIAL

James F. Gibbons, 320 Tennyson Ave., Palo Alto, Calif. 94301

Filed Apr. 16, 1984, Ser. No. 600,486
Int. Cl.⁴ H01L *21/31, 21/469*
U.S. Cl. 148—1.5 **16 Claims**



1. A process for forming on a substrate one or more very

thin films, and for controlling the uniformity of the thickness of said very thin films in a predetermined atmosphere having selected reactants comprising the steps of:

rapidly heating a substrate and linearly raising the temperature of said atmosphere at a first rate to a predetermined temperature;

maintaining said atmosphere at said elevated temperature for a selected time measured in seconds; and

cooling said substrate in the presence of selected reactants to provide a linear decrease of temperature at a second rate to a relatively low temperature.

4,544,419

METHOD FOR PRODUCING HIGH TENSILE STRENGTH COLD ROLLED STEEL SHEETS HAVING EXCELLENT FORMABILITY AND HIGH TENSILE STRENGTH HOT-DIP GALVANIZED STEEL SHEETS HAVING EXCELLENT FORMABILITY

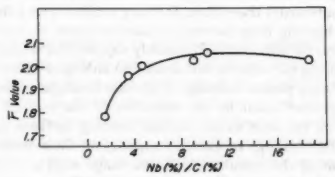
Toshio Irie; Susumu Sato, and Osamu Hashimoto, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 328,578, Nov. 27, 1981, Pat. No. 4,473,414. This application Jul. 5, 1984, Ser. No. 627,839

Claims priority, application Japan, Mar. 31, 1980, 55-41844; May 31, 1980, 55-73178

Int. Cl.⁴ C21D *8/04*

U.S. Cl. 148—12 C **3 Claims**



1. A method for producing high tensile strength cold rolled steel sheets having excellent formability, a tensile strength of more than 35 kg/mm² and a $\bar{r}$ value larger than 2, and which comprises hot rolling a steel slab consisting of 0.002–0.015% of C, not more than 1.2% of Si, 0.04–0.8% of Mn, 0.03–0.10% of P, 0.02–0.10% and not less than $N\% \times 4$ of Al, $C\% \times 3 - \{C\% \times 8 + 0.020\%\}$ of Nb and the remainder being substantially Fe and unavoidable impurities, to obtain a hot rolled coil, in said hot rolling the total reduction rate being at least 90%, the rolling speed in the finishing rolling being at least 40 m/min and the coiling-up temperature being at least 600° C., cold rolling the above-described hot rolled coil in a conventional process to obtain a cold rolled steel strip having a final gauge, subjecting the cold rolled steel strip to a continuous annealing at a temperature of 700°–900° C. for 10 sec–5 min and then cooling the annealed strip to 500° C. to a rate of at least 60° C./min.

4,544,420

WROUGHT ALLOY BODY AND METHOD

Dale Montgomery, Drumore, Pa., assignor to Electralloy Corporation, New York, N.Y.

Filed Mar. 1, 1983, Ser. No. 471,024

Int. Cl.⁴ C22C *38/44*

U.S. Cl. 148—37 **9 Claims**

1. A wrought alloy body having yield strength above about 100,000 psi and tensile strength above about 120,000 psi at room temperature and impact strength above about 90 ft. lbs. at 0° C. and consisting essentially of by weight from about 11.5% to about 14.0% chromium, about 4.0% to about 5.5% nickel, about 0.010% to about 0.030% carbon, about 0.6% to about 1.0% manganese, about 0.2% to about 0.8% silicon, about 0.5% to about 0.9% molybdenum; not more than about 0.04% phosphorous, 0.02% sulphur and 0.03% nitrogen; and the remainder iron and incidental residuals,

said alloy body having a fully martensitic structure.

4,544,421

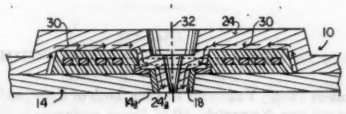
MULTI-DIRECTIONAL FIELD ANNEALING OF A THIN-FILM ELECTROMAGNETIC READ/WRITE HEAD

Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Fremont, Calif.

Filed Oct. 11, 1983, Ser. No. 540,388

Int. Cl.⁴ H01F *41/02*

U.S. Cl. 148—103 **4 Claims**



1. A method of field annealing a thin-film electromagnetic read/write head, having a read/write gap, formed of magnetic material having magnetic-field-responsive structure and a known Curie temperature, and also having electric current-carrying means for inducing magnetic flux in the head flowing in a path through such magnetic material during operation of the head, said method comprising the steps of

heating the head to a temperature less than the known Curie temperature,

after said heating, cooling the head,

during at least said step of cooling, applying electric current to the current-carrying means sufficient to induce magnetic flux in such head,

during said step of applying current, magnetically shorting the read/write gap of the head, and

by said foregoing steps, aligning magnetic-field-responsive structure in such material with the direction of flux flow in the head.

4,544,422

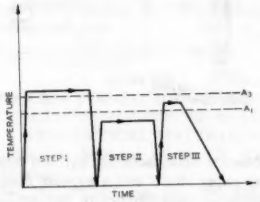
FERRITE-AUSTENITE DUAL PHASE STEEL

Bangaru V. N. Rao, Bridgewater, N.J., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1984, Ser. No. 595,727

Int. Cl.⁴ C21D *1/18*

U.S. Cl. 148—142 **3 Claims**



1. A heat treatment process for manufacturing a microalloy-free, high strength, low alloy, low carbon steel characterized by a dual phase microstructure comprising austenite particles distributed within a ferrite matrix, said steel comprising between about 0.1 and 0.6 weight percent carbon, greater than about 1.0 weight percent manganese, optionally up to about 1.25 weight percent silicon, and the balance substantially iron and impurities, said process comprising

(1) austenizing the steel at the temperature above the upper critical austenite transformation temperature, A_3, to produce a substantially austenite microstructure,

(2) quenching the austenitic steel to form a lath martensite microstructure,
(3) tempering the martensitic steel at a temperature below the lower critical temperature, A_1, to form a microstructure comprising cementite particles distributed within a ferrite matrix,
(4) annealing the tempered steel at an intercritical temperature to decompose the cementite and form dispersed austenite particles, and
(5) quenching the intercritically annealed steel at a rate sufficient to retain said dispersed austenite and thereby form said ferrite-austenite dual phase microstructure in said steel.

4,544,423

AMORPHOUS SILICON SEMICONDUCTOR AND PROCESS FOR SAME

Kazunori Tsuge; Yoshihisa Tawada, both of Kobe, and Yoshihiro Hamakawa, Kawanishi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 10, 1984, Ser. No. 578,939
Int. Cl.[4] C23C *11/00*; H01L *31/18*
U.S. Cl. 148—174 **8 Claims**

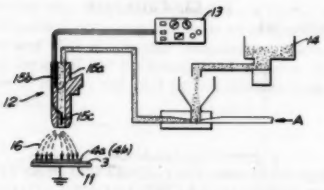
1. A process for preparing an amorphous silicon semiconductor by treating a silicon compound under conditions which will cause the silicon compound to undergo photolysis and plasma decomposition, said process comprising:
(a) irradiating the silicon compound with light of sufficient wave length and intensity to decompose the silicon compound and
(b) subjecting the silicon compound to conditions of glow discharge.

4,544,424

GYPSUM BOARD MANUFACTURING METHOD

Takao Take, Chiba; Katsuki Kaneko, and Sigeo Otozaki, both of Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Yamaguchi, Japan

Filed Oct. 28, 1982, Ser. No. 437,327
Claims priority, application Japan, Nov. 2, 1981, 56-174452
Int. Cl.[4] B32B *13/08*
U.S. Cl. 156—39 **1 Claim**



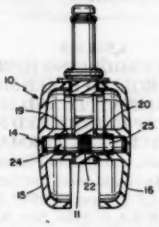
1. A process for manufacturing gypsum board having two opposed base paper sheets and a gypsum core layer therebetween, comprising electrostatically depositing a particulate material, reactive with water, on the interior surface of at least one of said paper sheets, in amount sufficient to form thereon a fixed layer of charged particles within the range of from about 1–50 g/m^2, and before the charge on said particles has become dissipated, introducing a core-forming slurry containing calcined gypsum between said base paper sheets to form an adhesion layer by contact between said slurry and said charged particulate material, followed by drying and curing to produce a gypsum board of improved strength and having the paper sheets thereof securely adhered to the gypsum core, said particulate material being selected from the group consisting of starch, heat-decomposed starch, dextrine, and mixtures thereof.

4,544,425

METHOD FOR ATTACHING WHEELS TO DUAL WHEEL CASTERS, INCLUDING ULTRASONIC WELDING

Daniel J. Provolo, Fairfield, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 7, 1984, Ser. No. 587,042
Int. Cl.[4] B60B *37/04*
U.S. Cl. 156—73.1 **5 Claims**



5. A method of forming a dual wheel caster, including the steps of: forming an axle with annular bearing surface at the outer ends thereof and annular recesses adjacent the bearing surfaces, each having a radial abutment surface, forming the axle with second bearing surfaces inwardly of the recesses, attaching the axle to a central horn member so the axle ends project outwardly therefrom, forming wheels with a first inner reduced bearing bore having a diameter equal to the bearing surfaces on the axle ends to rotatably support the wheels on the axle, forming the wheels with a second enlarged outer bushing bore, forming plastic bushings in annular configuration with an inner diameter equal to the diameter of the second bearing surfaces on the axle so the second bearing surfaces rotatably engage the bushings to assist in supporting the wheels on the axle, forming the annular plastic bushings with a plurality of generally axially extending spring fingers that curve radially inwardly to a diameter substantially equal to the inner diameter of the axle recesses and with radial flanges at the ends thereof opposite the fingers, inserting the bushings into the wheel bores until the bushing flanges engage the wheels to limit the inward mmovement of the bushings in the wheels, bonding the bushings to the wheels prior to insertion of the axle ends therein to thereby axially lock the bushings to the wheels, and thereafter inserting the axle ends into the bushings until the bushing projections snap into the axle recesses to axially lock the wheels on the axle ends.

4,544,426

METHOD AND APPARATUS FOR APPLYING A COATING MATERIAL TO A PIPE

James J. Stockman, Calgary, Canada, assignor to Shaw Industries Ltd., Toronto, Canada

Filed Oct. 24, 1983, Ser. No. 544,533
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—73.6 **14 Claims**

1. An apparatus for wrapping pipe comprising:
conveyor means for rotating and advancing the pipe in relation to its longitudinal axis;
a frame positionable at an angle with respect to the conveyor means;
a main endless belt supported by the frame upon which a continuous wrapping material is conveyed to the pipe, said wrapping material comprising a continuous carrier tape in contact with the main belt and a layer of coating material on the carrier tape;
at least one endless notching belt positioned on and near one edge of the main belt and which is driven thereby;
a roller positioned above the belts and having at least one notching disk for making at least one notch in the coating material opposite from the notch or notches made in the

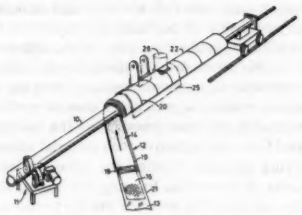
coating material by the notching belt or belts, so that said notches interlockingly overlap at the seam of the wrapped pipe, said roller being positioned to reduce the thickness of the coating material to that desired; and

a vibrating shoe positioned about the wrapped pipe for compacting the coating material.

12. A method for wrapping pipe with a strip of coating material, comprising:

rotating and advancing the pipe in relation to its longitudinal axis;

conveying a continuous wrapping material to the pipe by means of a main endless belt supported by a frame positionable at an angle with respect to the rotating and advancing pipe, said wrapping material comprising a continuous carrier tape in contact with the main belt and a layer of coating material on the carrier tape;



providing notching at the diagonally opposite edges of the coating strip by means of at least one endless notching belt positioned on and near one edge of the main belt and which is driven thereby, and by means of a roller positioned above the belts having at least one notching disk for making at least one notch in the coating material opposite from the notch or notches made in the coating material by the notching belt or belts, so that said notches provide an interlocking of the coating at the seam formed by wrapping the strip spirally about the pipe, said roller being positioned to reduce the thickness of the coating material to that desired; and

vibrationally compacting the coating material immediately after the strip is wrapped about the pipe.

4,544,427

APPLICATION OF AMBIENT TEMPERATURE CURED POLYMERS OR PREPOLYMERS TO A CURED ELASTOMER

Walter R. Hausch, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 477,451, Mar. 21, 1983, Pat. No. 4,435,456, which is a continuation-in-part of Ser. No. 316,023, Oct. 28, 1981, Pat. No. 4,399,852, which is a division of Ser. No. 164,127, Jun. 30, 1980, Pat. No. 4,327,138, which is a continuation-in-part of Ser. No. 73,760, Sep. 10, 1979, abandoned. This application Jan. 23, 1984, Ser. No. 584,659

Int. Cl.[4] **B29H** *5/16;* **B60C** *21/02;* **B32B** *25/04;* **F16L** *11/12*

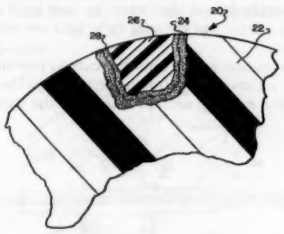
U.S. Cl. 156—97 **10 Claims**

1. A process for applying an amine curable polymer or prepolymer to a cured rubber substrate having unsaturated groups therein, comprising the steps of:

applying a treating agent to said rubber substrate, said treating agent selected from the group consisting of N-halohydantoins, N-haloamides, N-haloimides, and combinations thereof,

applying a polyisocyanate to said treating agent, said polyisocyanate having the formula $R(N{=}C{=}X)_n$ where R is an alkyl having from 2 to 20 carbon atoms, a cycloalkyl having from 4 to 20 carbon atoms, an aromatic or an alkyl substituted aromatic having from 6 to 20 carbon atoms, where n is 2 or 3, and where X is oxygen or sulfur,

applying an ambient temperature amine curable polymer or prepolymer system to said rubber substrate, and



curing said amine curable polymer or prepolymer at an ambient temperature.

4,544,428

METHOD OF MANUFACTURING A PRESSURE TANK

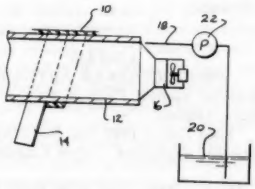
Goetz Mandel, Kirchseeon, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,668

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237761

Int. Cl.[4] **B23P** *17/00*

U.S. Cl. 156—161 **5 Claims**



1. A method of manufacturing a pressure tank, comprising forming a thin inner wall of light metal, applying a back-up wrapping of resin-impregnated fiber having a large breaking strength and a small coefficient of thermal expansion while it is maintained under tension over the thin inner wall which tends to cause an increasing winding coil load by accumulation of filament tension, and cooling the inner tank to offset the increasing winding coil load.

4,544,429

PROCESS FOR BENDING CUTS FOR MANUFACTURING GOODS OF LEATHER OR SYNTHETICAL MATERIALS

Ignacio O. Sanchez, Mariano Otero 127, Cojumatlán, Michoacán, Mexico

Division of Ser. No. 159,687, Jun. 16, 1980, Pat. No. 4,384,464. This application Aug. 13, 1982, Ser. No. 407,817

Claims priority, application Mexico, Nov. 14, 1979, 180043

Int. Cl.[4] **C14B** *1/30, 11/00*

U.S. Cl. 156—227 **4 Claims**

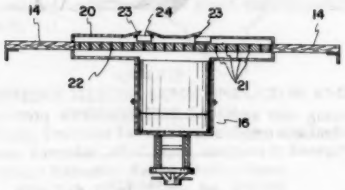
1. A method for bending cuts in a blank for manufacturing goods of leather or synthetic materials, comprising:

providing a pattern with cut-outs on a work bench provided with a cover having a screen for defining a delimited area, the cut-outs of the pattern being provided in a portion of their periphery with deformable protuberances which project out over the cut-outs, the pattern being made of a material that permits the pattern to adjust to the screen upon application of suction with the exception of those cut-out areas of the pattern having the protuberances and

on which the blank with the cuts are placed and said cuts in turn are suctional, thus adjusting themselves to the configuration of the cut-outs thereby beginning to bend the cuts by action of the periphery of the cut-outs;

placing the blank with the cuts to be bent onto the cut-outs wherein portions of the cuts to be bent are provided with adhesive;

exerting a suction action onto the cuts to provide a suction field by means of an extractor delimited to the area of the screen for exerting suction mainly on the cuts placed on



the cut-outs of the pattern to assist in bending the blank during application of suction through the cut-outs to the blank to conform the cuts to a desired configuration in accordance with the form of the cut-outs provided in the pattern placed onto the screen; and

exerting pressure with a press for automatic operation against the bending of the cuts while these still remain on the cut-outs of the pattern to obtain the bending of the cuts while these still remain on the cut-outs of the pattern to bend the cuts.

4,544,430

PRODUCTION OF ARTWORK

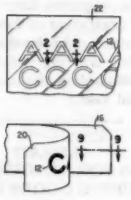
John V. Shepherd, Ashford, England, assignor to Letraset Limited, London, England

Filed Feb. 3, 1982, Ser. No. 345,400

Claims priority, application United Kingdom, Feb. 6, 1981, 8103677

Int. Cl.[4] **B44C** *1/16, 3/00;* **B32B** *1/00*

U.S. Cl. 156—235 **10 Claims**



1. In a method of producing artwork in which a desired legend is assembled using indicia from a dry transfer material, said dry transfer material consisting of a carrier film, indicia on the carrier film and a layer of adhesive covering the indicia and having a peel bond strength, the improvement comprising:

as an initial transfer step, transferring indicia sequentially from said carrier film to a surface of an intermediate carrier sheet to build up said desired legend thereon by adhering each of said indicia in turn via said adhesive layer covering said indicia in said dry transfer material to said intermediate carrier sheet, and removing said carrier film therefrom,

as an intermediate transfer step, transferring the entire assembly of indicia forming the legend to an adhesive web material by applying said adhesive web material to the exposed sides of the indicia on the intermediate carrier sheet, applying a liquid to the side of the intermediate carrier sheet opposite that to which the indicia are adhered, whereby to reduce the peel bond strength between said adhesive layer attaching the indicia to the intermediate carrier sheet and the surface of the intermediate carrier sheet to a value lower than the peel bond strength between the adhesive web material and the indicia, and peeling apart the adhesive web material and the intermediate carrier to leave the assembly of indicia adhered to said adhesive web material, each of said indicia carrying an exposed portion of said adhesive layer,

and, as a final transfer step, placing the adhesive web material on the artwork with the adhesive coated indicia in contact with said artwork and adjusting the adhesive web material until the legend is in a desired position relative to the artwork and then transferring the indicia forming the legend from said adhesive web material to said artwork by applying pressure through the adhesive web material in the area of the indicia forming the legend to adhere each of the indicia to the artwork via the portions of said adhesive layer with a peel bond strength between said portions and the surface of the artwork greater than the peel bond strength between the adhesive web material and the indicia and peeling the adhesive web material away from the artwork to expose the indicia and leave the indicia each adherent to the artwork via said adhesive layer and forming said desired legend in said desired position thereon.

4,544,431

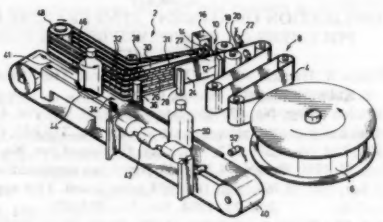
ROLL FED LABELLING MACHINE

George W. King, Scarborough, Canada, assignor to Stackpole Limited, Scarborough, Canada

Filed Feb. 6, 1985, Ser. No. 698,919

Int. Cl.[4] **B65C** *19/04*

U.S. Cl. 156—256 **20 Claims**



1. A roll fed labelling apparatus for applying a label to an article as it is moved past a labelling location comprising a label supply, cutting means for cutting a first label from the end of such label supply, means for intermittently advancing labels through said cutting means, conveyor means for transporting such first label in timed sequence with advancement of an article to be labelled, means for applying adhesive to at least the leading edge of such first label with such label held essentially stationary on said conveyor means, means for applying an adhesive to at least the trailing edge of such first label, means for applying such label to such article to be labelled and means for synchronizing the advance of the first to be applied label with such article to be labelled.

4,544,432

METHOD OF BONDING PHOSPHATED STEEL SURFACES ELECTRODEPOSITED WITH A PRIMER

Robert T. Foister, Rochester, and Richard K. Gray, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 29, 1984, Ser. No. 614,851
Int. Cl.[4] C09J 5/02
U.S. Cl. 156—307.3 2 Claims

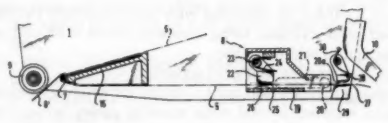
1. A method of adhesively bonding together surfaces of two steel components where at least one such surface is phosphated and electrodeposited with an organic primer comprising the steps of: applying to at least one such surface a heat curable two-part epoxy adhesive where the adhesive resin comprises in parts by weight 100 parts of a cross-linkable epoxy novolac resin having an epoxide equivalent weight in the range of from 150 to 200 and a viscosity at 50° C. in the range of from about 1000 to 2000 centipoise; from about 40 to 60 parts of an aliphatic epoxy reactive diluent which is the reaction product of a trifunctional alcohol and an epichlorohydrin having an epoxide equivalent weight in the range of from about 130 to 170 and a viscosity at 25° C. in the range of from about 120 to 240; from about 11 to 16 parts of imidazole curing agent substituted in at least one position with an alkyl or a hydroxyalkyl group; pressing and holding the two steel components together forming a permanent bond.

4,544,433

DEVICE FOR INTERMITTENTLY TRANSPORTING A LABEL BEARING TAPE IN A MANUALLY OPERATED LABELER

Kurt Schrotz, Beerfelden, and Werner Becker, Hirschhorn, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jan. 4, 1983, Ser. No. 455,560
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200977
Int. Cl.[4] B32B 31/00; B44C 7/00; B41F 1/08; B65H 17/26
U.S. Cl. 156—384 5 Claims



1. A manually operated labeler for intermittently transporting a label bearing tape, said labeler comprising tape advancing means for advancing the tape in a first direction for a predetermined distance so that (a) a first label is advanced to a printing position and (b) a second label is advanced to a label application position;

means for printing the first label after it has reached the printing position; and

means for applying the second label to an object after the second label has reached the second position;

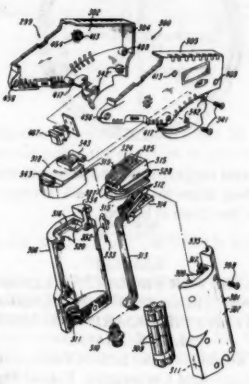
said tape advancing means including a transport carriage reciprocable along the label bearing tape and mounting a latch with a clamping face in frictional engagement with the label bearing tape so that during movement of the carriage in one direction opposite said first direction, it freely slides on the label bearing tape and, during movement of the carriage in said first direction, it clamps the label bearing tape against an abutment surface with a self-locking action, where the clamping face of the latch is covered with abrasive paper.

4,544,434

HAND-HELD LABELER

John D. Mistyurik, Tipp City, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 28, 1984, Ser. No. 582,338
Int. Cl.[4] B65C 11/02
U.S. Cl. 156—384 8 Claims



1. A hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing, a manually engageable handle adapted to hold a source of electrical energy, means for slidably detachably coupling the handle and the housing, the handle being positionable in an attached position on the housing or in a detached position in which the handle is separated from the housing, printing means including an electrically selectable print head having a plurality of printing elements, means for delaminating printed labels, means for applying printed labels, means for advancing the carrier web, means defining a path for guiding the web to the printing means, to the delaminating means, and to the web advancing means, electrical contact means mounted on the housing, electrical contact means mounted on the handle and cooperable with the housing contact means in the attached position, wherein one of the contact means includes a flexible resilient first contact member, wherein the other contact means includes a second contact member, a protective shield for the first contact member to protect the first contact member from damage, and slotted aperture means in the shield through which the second contact member projects into contact with the first contact member in the attached position of the handle, and wherein the first contact member includes a spring finger aligned with the slotted aperture means.

4,544,435

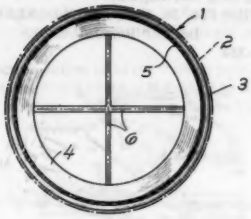
HEATABLE WINDING DRUM CONSTRUCTION FOR USE IN MANUFACTURING PLASTIC TUBES AND RECEPTACLES

Manfred Hawerkamp, Altenrather Strasse 47, 5210 Troidorf, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,271
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212141
Int. Cl.[4] B31C 13/00; B65H 81/00
U.S. Cl. 156—428 5 Claims

1. A heatable winding drum of steel for use in manufacturing helically wound tubes and receptacles made up of wound strips of thermoplastic material, comprising a cylindrical drum wall on an interior of said winding drum, a support structure within said cylindrical drum wall which comprises a plurality of longitudinally spaced support rings each having an outer circumference and a bracing structure within said support rings, and a heat-insulating layer provided between said support rings

and said cylindrical drum wall, said heat-insulating layer being made of elastic insulating material disposed on said outer circumference of said support rings and arranged so as to prevent dissipation of heat from the drum wall through said support structure when the drum is heated.

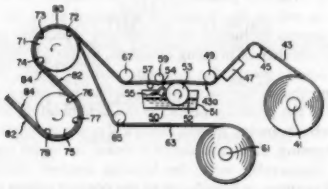


4,544,436

APPARATUS FOR PRODUCING COMPOSITE CORRUGATING MEDIA FOR THE MANUFACTURE OF CORRUGATED FIBERBOARD AND METHOD OF MAKING SAME

Shuji Itoh, and Koichi Hayashi, both of Tokyo, Japan, assignors to Kyokuto Fatty-Acid Corporation, Tokyo, Japan

Division of Ser. No. 379,017, May 17, 1982, Pat. No. 4,498,943. This application Oct. 9, 1984, Ser. No. 659,611
Claims priority, application Japan, Jun. 8, 1981, 56-086924
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—549 **7 Claims**



1. An apparatus for the manufacturing of corrugated fiberboard using a composite corrugating medium made from the lamination of two webs of corrugating medium with a water-soluble adhesive comprising:

(a) a first and second mill roll stand to supply a source of a first and a second web of a corrugating medium, respectively,

(b) a rod-coating unit for applying a coating of the water-soluble adhesive to the first web of corrugating medium, said coating unit being located in advance of the first mill roll stand for receiving the first web of corrugating medium;

(c) a suction-brake unit located between the first mill-roll stand and said rod-coating unit to provide tension for said first web of corrugating medium;

(d) a wire-wound rod unit located in advance of said rod coating unit to smooth the coating of adhesive applied to said first web of corrugating medium and to wipe off any excess adhesive so as to form a film of uniform thickness;

(e) a regulating roller device located between said wire-wound rod and rod-coating unit to adjust the pressure of contact between the first web of corrugating medium and said wire-wound rod;

(f) a first heating cylinder, wherein the first and second webs of corrugating medium are brought into contact with each other on the surface of said first heating cylinder and laminated through said water-soluble adhesive to form a loosely bound composite corrugating medium having first and second surfaces, said first heating cylinder providing heat to heat said first surface of said laminated composite corrugating medium; and

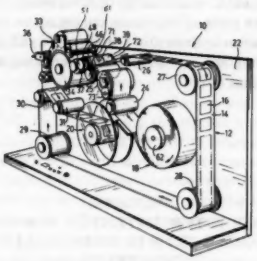
(g) a second heating cylinder which receives the loosely bound composite medium from the first heating cylinder in such a manner that said second and opposite surface of said laminated corrugating medium is in contact with the second heating cylinder so that said first and second surfaces of said laminated composite corrugating medium are heated by the first and second heating cylinders, respectively.

4,544,437

LABEL PRINTING DEVICE

William K. Gibson, Winnipeg, Canada, assignor to R.W. Packaging, Ltd., Winnipeg, Canada

Continuation of Ser. No. 449,841, Dec. 14, 1982, abandoned. This application Nov. 21, 1984, Ser. No. 673,992
Int. Cl.[4] B41F *13/04*
U.S. Cl. 156—584 **10 Claims**



1. A label printing device, comprising:

a supply roll means for rotatably supporting a roll of strip material;

take-up roll means for receiving said strip material from said supply roll means;

an impression cylinder rotatable about a first axis;

means for guiding said strip material from said supply roll means around said impression cylinder to said take-up roll means;

a print cylinder co-operating with said impression cylinder, said print cylinder beipg rotatable about a second axis parallel to said first axis;

means for rotating said print cylinder;

a printing plate on said print cylinder for printing onto said strip material as said strip material passes around said impression cylinder;

means for applying ink to said printing plate;

means for intermittently rotationally driving said impression cylinder from said print cylinder; and

braking means to inhibit rotation of said impression cylinder upon disengagement of said second formations from said first formations;

said drive means comprising first formations rotatable with said impression cylinder and second formations rotatable with said print cylinder and interengageable with said first formations;

said first formations being uniformly distributed around the entire periphery of said impression cylinder and said second formations being similarly uniformly distributed around only a portion of the periphery of said print cylinder;

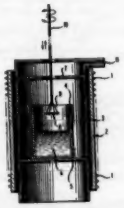
said second formations being successively engageable with said first formations for rotating said impression cylinder, whereby said impression cylinder remains undriven during rotation of the remainder of the periphery of said print cylinder past said impression cylinder.

4,544,438

LIQUID PHASE EPITAXIAL GROWTH OF BISMUTH-CONTAINING GARNET FILMS

Lars C. Luther, Basking Ridge, and Virendra V. S. Rana, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 31, 1984, Ser. No. 615,836
Int. Cl.[4] C30B *19/04*
U.S. Cl. 156—624 **5 Claims**



1. Method for making a magnetic bubble device comprising a layer of garnet material which contains bismuth and which is epitaxially deposited on a surface of a supporting substrate, said method comprising

heating a preferred melt consisting essentially of a garnet material which contains bismuth and a flux material at a temperature corresponding to supercooling of said garnet material, said flux material comprising lead oxide and bismuth oxide, and at least one additional flux-constituent oxide selected from the group consisting of vanadium oxide, tungsten oxide, and molybdenum oxide, the lead oxide being comprised in said flux material in an amount corresponding to an amount of PbO in the range of from 50 to 98 molecular percent, the bismuth oxide being comprised in said flux material in an amount corresponding to an amount of Bi_2O_3 in the range of from 1 to 30 molecular percent, said additional oxide being comprised in said flux material in an amount corresponding to an amount of V_2O_5, WO_3, or MoO_3 in the range of from 1 to 20 molecular percent,

bringing at least a surface of a substrate in contact with said melt, and

removing said substrate from contact with said melt upon deposition of a layer of said garnet material on said surface,

the degree of supercooling being chosen in combination with amount of said additional flux-constituent oxide so as to substantially achieve a desired level of magnetic anisotropy in said layer.

4,544,439

SYSTEM FOR REPAIRING ELECTRICAL SHORT CIRCUITS BETWEEN PARALLEL PRINTED CIRCUITS

Joseph M. Solomon, Endwell, and Kenneth J. Varker, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,527
Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—626 **40 Claims**

22. A method for eliminating short circuits on electrical circuitry interconnected by a hole being plated with a layer of electrically conductive material on an electrical board, the steps comprising:

(a) introducing an etchant into the hole to remove the layer of metal therefrom;

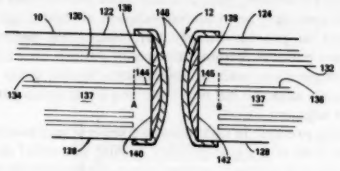
(b) vacuum removing said etchant from said hole;

(c) introducing a solvent into said hole to rinse residual etchant therefrom;

(d) vacuum removing said solvent from said hole;

(e) drying said hole; and

(f) introducing a non-conducting material into the hole to seal exposed internal conductive material.



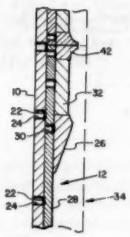
23. The method in accordance with claim 22, the steps further comprising detecting the endpoint of metal removal prior to introducing said solvent into said hole.

4,544,440

METHOD OF MANUFACTURING AN EMBOSSED PRODUCT

Robert G. Wheeler, 3927 Clarence Cir., Corvallis, Oreg. 97330

Continuation of Ser. No. 35,278, May 2, 1979, abandoned, which is a continuation of Ser. No. 832,111, Sep. 12, 1977, abandoned.
This application Sep. 15, 1980, Ser. No. 186,851
Int. Cl.[4] B32B *31/06, 31/16, 31/20*
U.S. Cl. 156—634 **1 Claim**



1. A method of manufacturing an embossed product comprising:

disposing a quantity of adhesive coated coarse wood particles between a pair of cellulosic fiber webs to form an assembly,

locating said assembly between the platens of a heated press provided with at least one caul plate having a first surface carrying a mold adapted for impressing a desired relief design comprising a plurality of adjacent but independent panel configurations onto said assembly, said mold comprising a plurality of individual inserts mating together to form each panel configuration wherein ones of said inserts are provided with differing substantially flat faced upper surfaces and flat lower surfaces, said inserts extending to selected levels for compressing said assembly to different embossing levels characterizing each such panel configuration to provide separately simulated carved wood elements formed by separate inserts, and wherein the flat lower surfaces of ones of said inserts are adapted to fit and slide on said first surface of said caul plate and the flat lower surfaces of other of said inserts are adapted to fit and slide on upper surfaces of inserts therebelow,

including machining said individual inserts to mate together for impressing the relief design, attaching said individual inserts to said caul plate and to other inserts as the case may be in adjacent edge abutting interfitting relation by tack welding, disengaging said inserts from said caul plate, applying a photo-resist material to individual inserts, separately exposing substantially flat faced upper surfaces of individual inserts through radiation illuminated flat trans-

parencies of wood grain surface patterns, developing the photo-resist, etching said inserts to provide the desired surface grain patterns thereon, and re-attaching said inserts by welding onto said caul plate and to other inserts as the case may be in mating relation at their original positions to provide closely adjoining grain patterns, said grain patterns forming an overall pattern on a said panel configuration, ones of said inserts having grain patterns closely adjacent but non-matching to the grain patterns on the adjacent insert,

exerting pressure in said press to compress said assembly into the form of a wood product having said relief design,

and severing said independent panel configurations from one another.

4,544,441

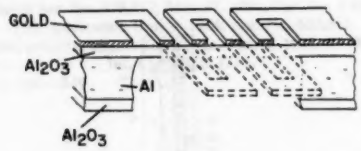
METHOD OF MAKING A BOLOMETRIC RADIATION DETECTOR

Rolf Hartmann, Kelkheim; Albrecht Krah, Wachtersbach; Hilda Egle, Heusenstamm, and Rudolf Ziegler, Remagen-Rolandseck, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 184,015, Sep. 4, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 512,546

Int. Cl.[4] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—634 **9 Claims**



1. Method of producing a bolometric radiation detector consisting essentially of a thin, temperature-sensitive, electrically-conductive measuring layer on an electrically insulating carrier film which is supported by a frame, the thickness of the measuring layer being less than 100 nm, comprising:

producing the carrier film on a base material;

applying a thin conductive layer composed of the material of the measuring layer to the carrier film;

providing the carrier film base material and the surface of the measuring layer material with a photoresist layer;

etching the printed conductors out of the conductive layer using a photolithographic method; and

producing a window from the reverse side in such a way that the carrier film with the measuring layer structure mreains, such being supported by a frame that is prepared from the substrate.

4,544,442

PROCESS FOR THE MANUFACTURE OF SUBSTRATES TO INTERCONNECT ELECTRONIC COMPONENTS

Charles L. Lassen, Cold Spring Harbor, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 254,132, Apr. 14, 1981, Pat. No. 4,500,389. This application Jul. 24, 1984, Ser. No. 633,877

Int. Cl.[4] **B44C** *1/22*

U.S. Cl. 156—643 **14 Claims**

1. A process for making circuits, the steps comprising:

(a) bonding a substrate to a support base;

(b) coating the exposed surface of the substrate with an energy activatable adhesive;

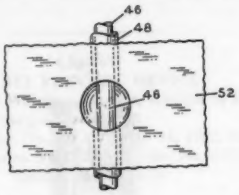
(c) applying and affixing to said coated surface in a pre-programmed circuit pattern to a base, a preinsulated conductor;

(d) applying to said coated surface and said conductor affixed thereto a coating for the purpose of maintaining the position of the filament and for providing a surface suitable for mounting surface-mounted components;

(e) without disturbing said affixed conductor leveling said coating over said surface and said conductor to form a substantially smooth, flat, planar surface;

(f) curing and hardening said coating;

(g) affixing the substrate with said cured and hardened coating and said insulated conductor therein on a table;



(h) aligning said table and said substrate affixed thereto with a high energy beam source so as to align a predetermined point on the conductor affixed to said substrate with said high energy beam source; and

(i) with said high energy beam source and said predetermined point so aligned, energizing said high energy beam source and with the beam of said beam source volatilizing the coating on said substrate at the area in alignment with said beam and exposing said aligned circuit conductor while maintaining the integrity of said conductor.

4,544,443

METHOD FOR MANUFACTURING AN OPTICAL MEMORY ELEMENT

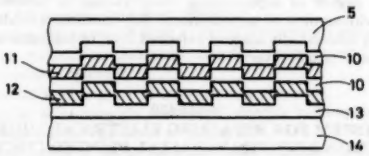
Kenji Ohta, Yao; Junji Hirokane, Tenri; Hiroyuki Katayama; Akira Takahashi, both of Nara, and Hideyoshi Yamaoka, Matsubara, all of Japan, assignors to Shap Kabushiki Kaisha, Osaka, Japan

Filed May 3, 1984, Ser. No. 606,534

Claims priority, application Japan, May 13, 1983, 58-84613; Jan. 10, 1984, 59-3797

Int. Cl.[4] **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **16 Claims**



1. A method for manufacturing an optical memory element comprising the steps of:

providing a substrate;

disposing a resist film on said substrate;

forming a guide groove pattern latent image on said resist film;

developing said guide groove pattern latent image formed on said resist film;

conducting an etching operation through said developed guide groove pattern so as to form guide grooves in said substrate;

removing said developed guide groove pattern from said substrate; and

disposing a recording medium layer on said substrate having said guide grooves formed therein.

4,544,444

REACTIVE ION ETCHING OF TIN OXIDE FILMS USING SILICON TETRACHLORIDE REACTANT GAS

Shih-Chia Chang, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1984, Ser. No. 640,938
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 2 Claims

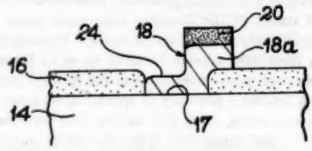
1. In a method of reactive ion etching, the improvement wherein tin oxide is reactive ion etched using a reactant gas consisting essentially of silicon tetrachloride, whereby the tin oxide is highly uniformly etched and without producing a residue that must be removed in a following step.

4,544,445

PROCESS FOR POSITIONING AN INTERCONNECTION LINE ON AN ELECTRIC CONTACT HOLE OF AN INTEGRATED CIRCUIT

Pierre Jeuch, Seyssins; Jean-Pierre Lazzari, Corenc, and Pierre Parrens, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 16, 1984, Ser. No. 590,190
Claims priority, application France, Mar. 18, 1983, 83 04472
Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 11 Claims



1. A process for the positioning of an interconnection line on an electric contact hole of an integrated circuit, wherein, with the electric contact hole formed, such that the contact hole edges are substantially perpendicular to the surface of the integrated surface, the following operations are performed:

deposition of at least one conductive layer on the complete integrated circuit, all of these conductive layers forming a conductive covering filling the contact hole and having a substantially planar surface following deposition and in which is produced the interconnection line, the first conductive layer being deposited isotropically;

formation of a resin layer on the conductive covering, so as to mask the interconnection line to be produced;

etching the resin-free part of the conductive covering;

overetching, within the electric contact hole that part of the conductive covering which is free from resin and;

elimination of the resin.

4,544,446

VLSI CHEMICAL REACTOR

Wayne A. Cady, Easton, Pa., assignor to J. T. Baker Chemical Co., Phillipsburg, N.J.

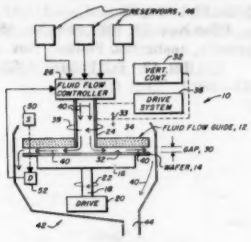
Filed Jul. 24, 1984, Ser. No. 633,938
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—639 31 Claims

29. A method for improving the reduction of contamination in the treatment of substrates processed with chemicals which contact a top surface in the substrate comprising the steps of:

providing the substrate and a holder therefor;

providing a fluid flow guide immediately above the substrate;

providing relative motion between the substrate and the fluid flow guide such that any chemical reaction taking place on said substrate does so through a combined mixing action and centrifugal force action which causes the chemicals to flow from the center of the substrate outwardly; and



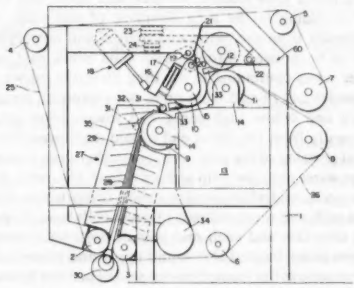
providing that the gap between the fluid flow guide and the substrate is such that the gap is continuously filled with fluid during processing in which any active chemical reaction is taking place on the surface of the substrate.

4,544,447

DEHYDRATION MACHINE FOR PULP, SLUDGES OR SIMILAR FIBROUS MATERIALS

Reinhard Pinter, Graz; Franz Petschauer, Lannach, and Johann Sbaschnigg, Graz, all of Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz-Andritz, Austria

Filed Jul. 27, 1983, Ser. No. 517,647
Claims priority, application Austria, Feb. 9, 1983, 436/83
Int. Cl.[4] D21F *1/00*; B01D *33/04*
U.S. Cl. 162—300 5 Claims



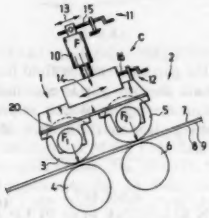
1. In a dehydration machine for pulp, sludges or similar fibrous material, composed of a lower sieve acting as a support sieve and of an upper sieve operating as a cover sieve, which sieves revolve about support and reversing rolls and are guided jointly through a wedging section arranged vertically or inclined at an acute angle and leading from the bottom to the top, with subsequent reversal of the sieve belts and of pairs of rolls through which is passed the material to be dehydrated coming from a material feed, the improvement wherein said wedging section is formed as a laterally closed support surface as a guide means and, followed directly by a reversal means provided with a lateral seal, and followed by a pressing section provided with a group of rolls comprising first and second pressing rolls arranged next to one another with a third pressing roll mounted above and in contact with said second pressing roll, and including a pressing system for the first pressing roll which selectively makes possible areal pressing from the first pressing roll with an ensuing pressing nip at the second and third pressing rolls, or two linear pressings, one at the first and second pressing rolls, the other at the second and third pressing rolls.

4,544,448

FILTER PRESS

Tuomo Lintunen, Savonlinna, Finland, assignor to Enso-Gutzeit Osakeyhtiö , Helsinki, Finland

Filed Nov. 23, 1983, Ser. No. 554,836
Claims priority, application Finland, Nov. 25, 1982, 824052
Int. Cl.[4] D21F *3/06, 3/02*
U.S. Cl. 162—360.1 **3 Claims**



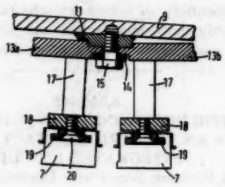
1. Filter press having a main press with an inlet end and an outlet end and a long direction extending in the direction between the inlet end and the outlet end, said main press having upper and lower rollers extending transversely of the long direction and spaced apart in the long direction, an upper wire and a lower wire located between said upper and lower rolls and extending in the long direction of said main press and outwardly from the outlet end thereof and conveying a pulp web to be pressed through said main press, said upper and lower wires continuing in the long direction outwardly from the outlet end of said main press, after-pressing means spaced above and below said upper and lower wires and located outwardly from the outlet end of said main press for effecting a final pressing of the pulp web located between said upper and lower wires after the pulp web exits from the outlet end of said main press, said after-pressing means comprising a first pair of press rolls and a second pair of press rolls spaced apart in the long direction and each said pair of press rolls comprising a topside roller located above said upper and lower wires and a bottom side roller located below said upper and lower wires, a single common support member supporting said topside rollers of each said pair of press rolls in fixed positions relative to one another and to said support member, a pressure cylinder for applying pressure to said support member for pressing said topside rollers toward said bottom side rollers and exerting a force (F) against said support member so that the force (F) is distributed to said topside rollers whereby said topside rollers of said first pair of press rolls exerts a force (F_1) and said topside roller of said second pair of press rolls exerts a force (F_2), a single control means acting on said support member and on said pressure cylinder for applying pressure for adjusting the pressure ratio F_1/F_2 exerted by said topside rollers, said pressure cylinder has an upper end and a lower end, said control means comprising a first support bracket for the upper end of said cylinder containing a plurality of mounting points, a second support bracket for the lower end of said pressure cylinder fixed to said support member and having a plurality of mounting points corresponding to said mounting points in said first bracket, said mounting points spaced apart in the long direction, whereby the position of said cylinder can be adjusted in the long direction relative to said support member and said pulp web.

4,544,449

APPARATUS FOR DE-WATERING FIBROUS SUSPENSIONS

Ronnie A. Arav, Lancashire, England, assignor to Beloit Walmsley Limited, Lancashire, England

Filed Oct. 11, 1983, Ser. No. 540,314
Int. Cl.[4] D21F *1/48*
U.S. Cl. 162—374 **8 Claims**



1. Apparatus for de-watering a fibrous suspension through a traveling, forming wire with which it is in contact, comprising:

a suction housing;

a cover for the suction housing;

at least two plank members comprising part of the cover and extending in a direction generally transverse to the direction of travel of the forming wire each plank member being releasably secured to the suction housing and being spaced from said suction housing so as to form a space between each plank member and the suction housing;

each plank having a plurality of spaced-apart pins, each pin having two ends, each pin having one end thereof attached to and projecting from the plank member, said plurality of pins also being disposed in a plurality of spaced-apart rows extending in a direction generally transverse to the direction of travel of the forming wire;

each plank having a plurality of foil strips, each foil strip secured to the plank member at the other end of each of a plurality of spaced-apart pins in a row to define, with the other foil strips, a space between the foil strips and the plank member, and an active surface over the foil strips.

4,544,450

ELECTROCHEMICAL PROCESS FOR THE SYNTHESIS OF ORGANIC COMPOUNDS

Ermanno Oberrauch, Milan, Italy, and Lennard Eberson, Lund, Sweden, assignors to Anic S.p.A., Palermo, Italy

Continuation of Ser. No. 275,609, Jun. 22, 1981, abandoned.
This application Jun. 30, 1983, Ser. No. 509,863
Claims priority, application Italy, Jul. 15, 1980, 23441 A/80
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—59 R **7 Claims**

1. In an electrochemical process conducted in an undivided electrolytic cell having a graphite anode and a platinum cathode, wherein a starting methylbenzene compound, having at least one methyl group bonded to the nucleus thereof, is reacted, at the anode with an acetate in the presence of acetic acid to form the corresponding nuclear acetate and a benzyl acetate byproduct, and wherein hydrogen evolves at said cathode, the improvement which comprises

adding a hydrogenolysis catalyst comprised of a precious metal on a carbon substrate in an amount sufficient to cause said hydrogen to react, at said cathode, with said benzyl acetate by-product, to regenerate said starting methylbenzene compound and acetic acid.

4,544,451
APPARATUS WITH TWO-STAGE HEATING FOR CARBONIZING COLD-COMPACTED BRIQUETTES

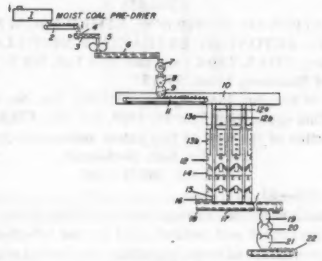
Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen, and Horst Dungs, Herne, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 458,278, Jan. 17, 1983,. This application Feb. 16, 1984, Ser. No. 580,794

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202161

Int. Cl.[4] C10B *1/04, 3/02*

U.S. Cl. 202—114 2 Claims



1. An apparatus for carbonizing coal briquettes, comprising a coking shaft oven having a plurality of vertically elongated horizontally arranged coking shafts, a belt-type preheater arranged over said coking shafts and operable at a speed of about 80 to 150 mm per minute, delivery means for delivering briquettes of coal and sulfite liquor to said preheater, distribution means located between said preheater and said coking shaft oven for distributing preheated briquettes into the coking shafts, said coking shaft oven including a first stage made of metal and extending about one-half the height of said coking shaft around a top portion of said shafts and operating at a medium temperature, a second stage made of ceramic material and extending around intermediate portions of said shaft and operating at a higher temperature, and a cooling stage below said second stage and surrounding lower portions of said shafts, cooling gas means in said cooling stage for supplying cool cooling gas to a bottom of each coking shaft and for withdrawing hot cooling gases from a location in said coking shafts corresponding to a top of said cooling stage and a bottom of said second stage, said second stage including stretcher walls made of ceramic material and bounded on one side by adjacent coking shafts and defining a heating flue on an opposite said thereof, said second stage including air supply means for supplying air to each heating flue and rich gas supply means for supplying rich gas to a bottom of each heating flue for combustion in each heating flue between said stretcher walls, said first stage including outer metal walls bound said coking shafts and flue gas passage means defined on sides of said metal walls opposite from said coking shafts, said flue gas passage means connected to said heating flues for the passage of flue gas from said heating flues to heat the top portion of said coking shafts at the medium temperature, flue gas control valve means connected to said flue gas passage means at a top of said first stage for controlling the passage of flue gas and thus controlling the medium and higher temperatures, and crude gas discharge means in said first stage communicating with said coking shafts for discharging crude gas from said coking shafts.

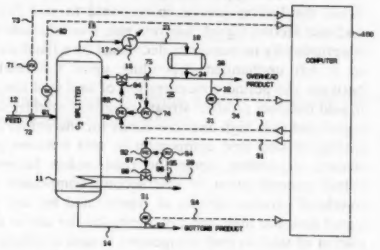
4,544,452
CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Mary M. Halliday, Old Ocean, and Glen R. Jackson, Bay City, both of Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1983, Ser. No. 528,023

Int. Cl.[4] B01D *3/42*

U.S. Cl. 203—1 12 Claims



1. Apparatus comprising:

a fractional distillation column;

means for passing a feed mixture containing at least first and second components into said fractional distillation column;

means for passing a heating fluid to said fractional distillation column;

means for withdrawing an overhead vapor stream, having a substantially increased concentration of said first component with respect to the concentration of said first component in said feed mixture, from an upper portion of said fractional distillation column;

means for condensing at least a portion of said overhead vapor stream;

an accumulator;

means for passing the resulting at least partially condensed overhead stream into said accumulator;

means for withdrawing condensate from said accumulator and for passing a first portion of the thus withdrawn condensate into an upper portion of said fractional distillation column as an external reflux stream therefor and for passing a second portion of the thus withdrawn condensate as an overhead product stream;

means for withdrawing a bottoms product stream, having a substantially increased concentration of said second component with respect to the concentration of said second component in said feed mixture, from a lower portion of said fractional distillation column;

means for establishing a first signal which is representative of the concentration of said first component in said bottoms product stream;

means for establishing a second signal representative of the concentration of said second component in said overhead product stream;

means for establishing a first control signal representative of the desired flow rate of said external reflux stream in response to said first signal and said second signal, wherein said first control signal is periodically increased or decreased by a fixed increment or left unchanged depending upon the relationship between the actual concentration of said first component in said buttoms product stream as represented by said first signal and a high limit and low limit for the actual concentration of said first component in said bottoms product stream, depending upon the relationship between the actual concentration of said second component in said overhead product stream as represented by said second signal and high and low limits for the actual concentration of said second component in

said overhead product stream and depending on the relationship between the magnitude of said first control signal and a high limit for the flow rate of said external reflux stream;

means for manipulating the flow rate of said external reflux in response to said first control signal so as to maintain the actual external reflux flow rate substantially equal to the desired external reflux flow rate as represented by said first control signal;

means for establishing a second control signal representative of the desired temperature at a selected point in said fractional distillation column in response to said first signal and said second signal, wherein said second control signal is periodically increased or decreased by a fixed increment or is left unchanged depending upon the relationship between the actual concentration of said first component in said bottoms product stream as represented by said first signal and said high and low limits for the actual concentration of said first component in said bottoms product stream, depending upon the relationship between the actual concentration of said second component in said overhead product stream as represented by said second signal and said high and low limits for the actual concentration of said second component in said overhead product stream and depending on the relationship between the magnitude of said first control signal and a high limit for the flow rate of said external reflux stream; and

means for manipulating the flow rate of heat to said fractional distillation column in response to said second control signal so as to maintain the actual temperature at said selected point substantially equal to the desired temperature represented by said second control signal.

4,544,453

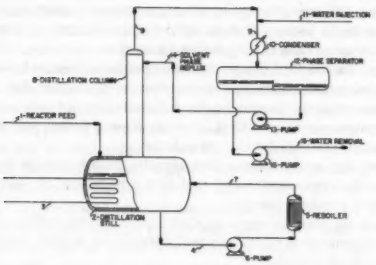
STRIPPING OF UNREACTED GLYCOL ETHERS AND ACIDS FROM AN ESTERIFICATION REACTION MIXTURE

Vijai P. Gupta, Berwyn, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 476,305, Mar. 17, 1983,. This application May 31, 1984, Ser. No. 615,393

Int. Cl.[4] C07C *67/24, 67/48;* **B01D** *3/36*

U.S. Cl. 203—44 **11 Claims**



1. A method for the removal of unreacted alkylene glycol monoalkyl ether and unreacted monocarboxylic acid from an acid catalyzed esterification reaction product mixture containing said glycol ether and acid along with a predominant amount of the monocarboxylic acid ester of the alkylene glycol monoalkyl ether and produced by said esterification which comprises the steps of:

distilling at a temperature of from about 50° C. to 150° C. said esterification reaction product mixture in the presence of an inert azeotroping solvent to remove via a distillation column unreacted monocarboxylic acid and unreacted alkylene glycol monoalkyl ether from the reaction product mixture as a vaporous distillate;

injecting water into the vaporous distillate containing the monocarboxylic acid, glycol ether and solvent azeotrope;

condensing the distillate containing the water forming a solvent phase and a water phase which extracts and contains the monocarboxylic acid and unreacted glycol ether;

returning and refluxing the solvent phase to the overhead section of the distillation column; and

removing the water phase containing the unreacted alkylene glycol monoalkyl ether and unreacted monocarboxylic acid.

4,544,454

SEPARATION OF ISOPROPYL ETHER FROM METHYL ETHYL KETONE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Division of Ser. No. 488,398, Apr. 25, 1983, Pat. No. 4,459,178. This application Feb. 10, 1984, Ser. No. 578,869

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.[4] B01D *3/40*

U.S. Cl. 203—51 **8 Claims**

1. A method for recovering isopropyl ether from a mixture of isopropyl ether and methyl ethyl ketone which comprises distilling a mixture of isopropyl ether and methyl ethyl ketone in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure isopropyl ether as overhead and obtaining the extractive agent and methyl ethyl ketone from the stillpot or reboiler, the extractive agent comprises at least adiponitrile.

4,544,455

SALT BRIDGE LIQUID

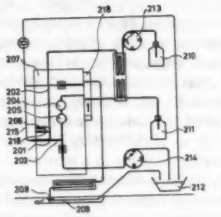
Anne R. Eisenhardt, Birkerod, and Ole J. Jensen, Soborg, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Filed May 17, 1983, Ser. No. 495,262

Claims priority, application Denmark, May 17, 1982, 2206/82

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **6 Claims**

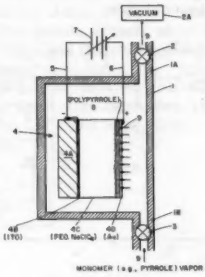


1. A method for the determination of the concentration of an ion in a sample of blood or blood liquid, using a measuring chain comprising an ion-sensitive indicator electrode and a reference electrode in which the ion-sensitive indicator electrode is brought into contact with the sample and the reference electrode is brought into contact with a salt bridge liquid which, through a liquid junction, is in contact with the sample, the salt bridge liquid used containing Na^+-ions and $HCOO^-$ ions.

4,544,456
METHOD OF SYNTHESIZING POLYMERS FROM A SOLID ELECTROLYTE

Terje A. Skotheim, East Patchogue, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1984, Ser. No. 662,657
Int. Cl.[4] C25C *3/00*
U.S. Cl. 204—59 R **14 Claims**



1. A method of synthesizing an electrically conductive polymer from a solvent-free solid polymer electrolyte, comprising the steps of:

a. providing a substrate with an electrode thereon,

b. providing a solution of high molecular weight poly (ethylene oxide) (PEO) complexed with at least one alkali metal salt in a solvent,

c. solution casting onto said substrate a thin film of said solution of PEO-salt and removing the solvent from said solution,

d. forming a semi-transparent noble metal electrode film having a maximum predetermined thickness on the PEO salt film, thereby to define a thin film electrode that has a high density of pinholes through it, through which pinholes monomers can diffuse into said PEO-salt and through which pinholes photoelectrons can escape from the PEO-salt,

e. placing the substrate with said PEO salt film and said noble metal film electrode in an evacuated chamber, and introducing a selected monomer vapor into the chamber, and

f. applying an electric potential across said electrodes to hold the thin film electrode at a positive potential relative to the electrode on said substrate, thereby to effect electrochemical oxidation of said monomers and to grow a highly conducting polymer film of a selected thickness on one of said electrodes.

4,544,457
DIMENSIONALLY STABLE DRAINED ALUMINUM ELECTROWINNING CATHODE METHOD AND APPARATUS

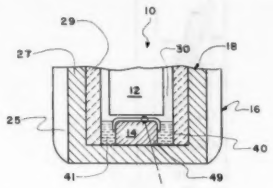
Ajit Y. Sane, Willoughby; Douglas J. Wheeler, Cleveland Heights, both of Ohio, and Charles S. Kuivila, Evanston, Ill., assignors to Eltech Systems Corporation, Baca Raton, Fla.

Continuation-in-part of Ser. No. 376,628, May 10, 1982, abandoned. This application Jun. 17, 1983, Ser. No. 505,229
Int. Cl.[4] C25C *3/06, 3/08;* C25B *11/03, 11/04*
U.S. Cl. 204—67 **17 Claims**

7. A method for making a drained aluminum electrowinning cathode surface dimensionally stable comprising the steps of:

sheathing said surface in close conformance to contours of the cathode surface at least where such surface contacts aluminum being electrowon, said sheath having a plurality of apertures traversing the sheath thickness, the apertures being of size and configuration whereby molten aluminum is retained within the apertures during electrolysis; and

electrolyzing a composition for electrowinning aluminum in contact with the resulting sheath surface; thereby



providing a coating including substantially stagnant molten aluminum upon the cathode.

4,544,458
FLUORINATED ION EXCHANGE POLYMER CONTAINING CARBOXYLIC GROUPS, PROCESS FOR MAKING SAME, AND FILM AND MEMBRANE THEREOF

Walther G. Grot, Chadds Ford, Pa.; Charles J. Molnar, and Paul R. Resnick, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 959,839, Nov. 13, 1978, Pat. No. 4,267,364, which is a continuation-in-part of Ser. No. 789,726, Apr. 20, 1977, abandoned, and Ser. No. 789,727, Apr. 20, 1977, abandoned. This application Jun. 16, 1980, Ser. No. 159,796
Int. Cl.[4] C25B *1/14, 1/18, 1/34;* C08F *5/20*
U.S. Cl. 204—98 **34 Claims**

1. A process which comprises contacting a first fluorinated polymer which contains pendant side chains containing

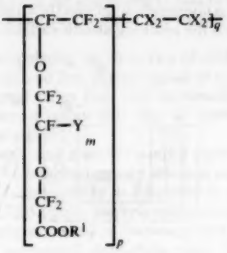
$$-\underset{\underset{R_f}{|}}{CF}-CF_2-SO_2M\left(\frac{1}{n}\right)$$

groups, wherein R_f is F, Cl or a C_1 to C_{10} perfluoroalkyl radical, M is H, an alkali metal or an alkaline earth metal, ammonium, substituted ammonium including quaternary ammonium, or hydrazinium including substituted hydrazinium, and n is the valence of M, with suitable oxidizing agent capable of introducing into the infrared spectrum of the resulting polymer absorption bands at about 1785 cm^{-1} or about 1680 cm^{-1}, and separating therefrom a second fluorinated polymer which contains pendant side chains containing

$$-\underset{\underset{R_f}{|}}{CF}-COO-M\left(\frac{1}{n}\right)$$

groups.

30. An electrolytic cell comprising a housing with separate anode and cathode sections, said sections separated by a film or membrane of a fluorinated ion exchange polymer having the repeating units



wherein
m is 0, 1, or 2,
p is 1 to 10,
q is 3 to 15,
the X's taken together are four fluorines or three fluorines and one chlorine,
Y is F or CF_3, and
R^1 is an alkali metal,
said polymer having an equivalent weight no greater than about 1500 and no less than about 625.

4,544,459

PROCESS FOR OBTAINING HYDROGEN AND OXYGEN FROM WATER

Bernd-Dieter Struck, Langerwehe; Bernd Biallas, Aachen, and Rudolf Schulten, Aachen-Richterich, all of Fed. Rep. of Germany, assignors to Gesellschaft mit Beschränkter Haftung Kernforschungsanlage Jülich, Jülich, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,706

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1983, 332494584

Int. Cl.[4] C25B *1/22, 1/24, 1/02*

U.S. Cl. 204—103 **10 Claims**

1. A two-stage hybrid process for obtaining hydrogen and oxygen from water by partly using electrolysis and using iodine recycled in the process which comprises using a two-chamber cell with an intermediate membrane separating the two chambers, the process including: electrolyzing in a first electrolysis state using an anodic chamber and a cathodic chamber separated by a membrane that conducts hydrogen ions, adding iodine to said cathodic chamber, forming oxygen in said anodic chamber, forming cathodic hydrogen iodide in said cathodic chamber, separating and extracting a hydrogen iodide-containing phase from said cathodic chamber and passing said hydrogen iodide without electrolysis to a second stage and thermally decomposing hydrogen iodide into hydrogen and iodine and recycling said iodine to said cathodic chamber.

4,544,460

REMOVAL OF POTASSIUM CHLORIDE AS A COMPLEX SALT IN THE HYDROMETALLURGICAL PRODUCTION OF COPPER

Leonard R. Ochs, Tucson, Ariz., assignor to Duval Corporation, Houston, Tex.

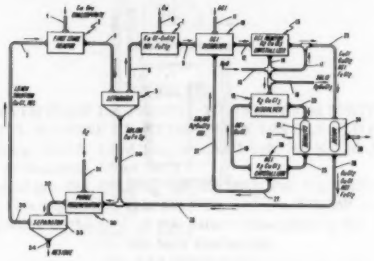
Filed Jun. 9, 1981, Ser. No. 272,024

Int. Cl.[4] C25C *1/12*

U.S. Cl. 204—107 **11 Claims**

1. In a hydrometallurgical process for the production of metallic copper comprising an oxidation stage in which materials containing copper sulfide ore or concentrates are oxidized with a solution containing ferric chloride and cupric chloride to effect substantial solubilization of the copper content of the materials in the form of cuprous chloride, a reduction stage in which any remaining cupric chloride in the solution from the oxidation stage can be reduced to cuprous chloride, an electrolysis stage in which metallic copper is recovered from the cuprous chloride solution, and cupric chloride is regenerated by electrolysis of the cuprous chloride solution from the reduction stage, and a regeneration-purge stage in which the ferric chloride and cupric chloride are regenerated by oxidation with concurrent purge of excess iron; the improved process for increasing the purity of the metallic copper recovered from the system in the electrolysis stage by removal of impurities, which comprise:

(a) effecting a separation following the first oxidation stage to remove insoluble materials and form a reduced leach solution containing cuprous chloride, cupric chloride, potassium chloride and iron chloride;



(b) adding sufficient potassium chloride to the solution to provide at least 2 moles of KCl per mole of CuCl that is to be removed from the system, and provide a solution containing about 4.0 to 6.0 molal potassium chloride;

(c) cooling the resultant saturated solution to allow precipitation of a solid complex salt of potassium chloride and cuprous chloride;

(d) removing the crystallized salt complex from the resulting reduced leach feed solution; and

(e) passing the reduced feed solution to the electrolysis stage, and recovering copper of increased purity.

4,544,461

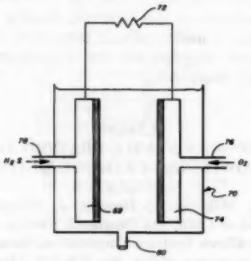
HYDROGEN SULFIDE DECOMPOSITION CELL AND CATALYTIC MATERIALS THEREFOR

Srinivasan Venkatesan, Royal Oak; Naum Pinsky, and Krishna Sapru, both of Troy, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 28, 1983, Ser. No. 479,476

Int. Cl.[4] C25B *1/00, 11/00*

U.S. Cl. 204—128 **12 Claims**



1. An anode for electrochemically oxidizing a sulfur containing gas, comprising:

a multicomponent compositionally disordered catalytic material including a host matrix including at least one element selected from the group consisting of transition elements and at least one modifier element incorporated into said host matrix, said modifier element selected from the group consisting of sulfur and oxygen, said modifier element modifying the local structural and chemical envi-

ronment throughout the bulk of said material to provide said disorder, said material having at least one amorphous phase, microcrystalline phase, polycrystalline phase lacking long range compositional order, or any combination of these phases.

4,544,462

PROCESS FOR REMOVING METAL SURFACE OXIDE

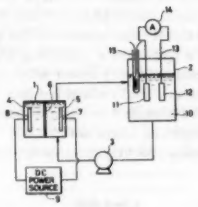
Yasumasa Furutani, Katsuta; Yasuo Hira, Hitachi; Takashi Hasegawa, Ibaraki; Akira Minato, Hitachi; Saburo Shoji, Hitachi, and Osao Sumita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Jun. 13, 1984, Ser. No. 620,335

Claims priority, application Japan, Jun. 13, 1983, 58-105446

Int. Cl.⁴ C25B *1/04;* **C25F** *1/06*

U.S. Cl. 204—129 **11 Claims**



1. A process for removing a metal surface oxide layer from a metallic substance by contacting the metal surface oxide layer with a gaseous hydrogen containing deterging liquid to introduce electrons into the metal surface oxide in contact with the deterging liquid and to dissolve the metal surface oxide, wherein the metal surface oxide layer is composed mainly of an iron oxide, the electrons are formed on the metal surface oxide layer, and the deterging liquid contains at least one of an organic acid, an organic salt or an organic complexing agent, and further wherein a metal piece selected from at least one of platinum, palladium, nickel, iron, copper and stainless steel or a carbon piece is immersed in the deterging liquid and the metal piece or the carbon piece is electrically connected with the metal surface oxide layer of the metallic substance.

4,544,463

METHOD FOR PRODUCING EQUIAXED IRON OR IRON ALLOY PARTICLES

Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 498,615, May 27, 1983, Pat. No. 4,461,685. This application Jan. 12, 1984, Ser. No. 570,119

The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.

Int. Cl.⁴ C25F *5/00;* **C22D** *5/00;* **C23C** *1/10*

U.S. Cl. 204—146 **14 Claims**

1. A method of producing substantially equiaxed iron or iron alloy particles, comprising the steps of:

providing a melt including a base metal consisting essentially of copper, transition metal additions of less than about 10% by weight to enhance magnetic performance, and above about 20% by weight of iron;

rapidly solidifying said melt into a copper or copper alloy strip having distributed therein fine, substantially equiaxed particles of iron or iron alloy; and

selectively dissolving said copper or copper alloy without substantial dissolving of said iron or iron alloy particles to recover said substantially equiaxed particles, said step of dissolving including immersing said copper or copper alloy strip in an electrolytic solution selected from the group consisting of alkaline metal sulfates so that the iron

or iron alloy particles are passivated while permitting electrolytic dissolution of the copper or copper alloy strip.

4,544,464

GROUND ANODE PREPACKED WITH BACKFILL IN A FLEXIBLE STRUCTURE FOR CATHODE PROTECTION WITH IMPRESSED CURRENTS

Giuseppe Bianchi; Gianluigi Mussinelli, and Giuseppe Faita, all of Lugano, Switzerland, assignors to Oronzio de Nora S.A., Lugano, Switzerland

Filed Apr. 23, 1984, Ser. No. 602,819

Claims priority, application Italy, Dec. 23, 1983, 24356 A/83

Int. Cl.⁴ C23F *13/00*

U.S. Cl. 204—147 **8 Claims**

8. A cathode protection process for metallic structures subject to electrochemical corrosion comprising:

(a) connecting the metallic structure to the negative pole of an electric current source;

(b) constructing an anodic structure by coaxially centering one or more flexible anodic elements surrounding a flexible conductor within a corrodable flexible entirely metallic external casing by using one or more spacers between said one or more flexible anodic elements and said flexible entirely metallic casing;

(c) packing said anodic structure with backfill between said external casing and said one or more flexible anodic elements;

(d) sealing said anodic structure; and

(e) connecting said anodic structure to the positive pole of said electric current source.

4,544,465

GALVANIC ANODES FOR SUBMERGIBLE FERROUS METAL STRUCTURES

Glenn A. Marsh, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

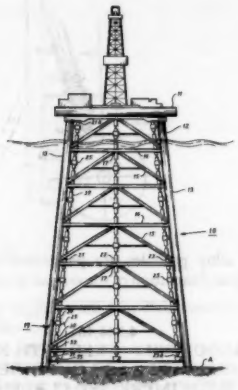
Filed Oct. 26, 1983, Ser. No. 545,533

Int. Cl.⁴ C23F *13/00*

U.S. Cl. 204—148 **20 Claims**

15. A method for providing galvanic protection to a submerged ferrous metal structure, in a salt water environment, which comprises providing a substantially, vertically oriented, rigid string of anode units and one or more insulating spacers, each anode unit and insulating spacer comprising a rigid core and said anode unit comprising a body of sacrificial anode material and said insulating spacer comprising insulating material, said sacrificial anode material and said insulating material surrounding and being supported by said rigid core, wherein the ends of said rigid core extend beyond the ends of the body

of sacrificial anode material and insulating material and each end being adapted to be coupled to the end of another similar sacrificial anode unit or an insulating spacer to provide said



rigid string; passing said rigid string through a plurality of string guides affixed to said ferrous metal structure; and electrically connecting at least one end of said string to said structure in a manner to provide galvanic protection thereto.

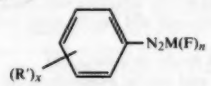
4,544,466

PROCESS OF MAKING U.V. CURED POLYURETHANES USING DIAZONIUM SALT PROMOTERS

Merlin R. Lindstrom, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1983, Ser. No. 558,650
Int. Cl.[4] C08G *18/16, 18/28, 18/08, 71/04*
U.S. Cl. 204—159.11 **6 Claims**

1. In a process for the production of polyurethane compounds by the polymerization reaction of a diisocyanate compound of the formula OCN—R—NCO wherein R is a C_4 to C_{20} alkylene, arylene, alkarylene or aralkylene radical with at least one diol and at least one polyol, the improvement which comprises admixing with said diisocyanate compound and said diol and polyol as a catalyst for said polymerization reaction at least one diazonium salt compound of the formula



wherein R' is any electron withdrawing group, M is one selected from the group consisting of B, P, As, Sb, Bi and Sn, n is 4, 5 or 6, and x is 1, 2 or 3; and thereafter subjecting the resulting reaction mass to ultraviolet light in the wavelength range of about 2000 to about 4000 Angstroms for a period of about 0.1 to 20 minutes at a temperature in the range of about 0° F. to about 180° F.

4,544,467

LIGHT-CURABLE DENTIN AND ENAMEL ADHESIVE

James E. Bunker, and Richard P. Fields, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

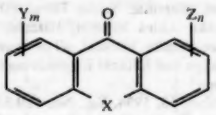
Filed Jun. 28, 1983, Ser. No. 508,807
Int. Cl.[4] C08J *3/28;* **C08L** *85/02*
U.S. Cl. 204—159.24 **15 Claims**

1. A visible light cure dentin and enamel primer composition, comprising:

(a) as a first component, phosphorous-containing free-radically polymerizable monomer suitable for use in the oral environment;

(b) as a second component, sulfur compound having sulfur in the $^{+2}$ or $^{+4}$ oxidation state, said second component acting as a polymerization activator for said first component and enhancing adhesion of said composition to dentin; and

(c) as a third component, photoinitiator selected from substituted and unsubstituted alkylphenones, substituted and unsubstituted benzilidene acetophenones, and compounds of the formula:



I

wherein:

X is nothing, a carbon-carbon bond, CR_2, C=[1], C=O, S, SO, SO_2, O, or NR where each R is independently H or a lower alkyl or substituted alkyl group and R^1 is a tetravalent unsaturated aliphatic radical doubly bonded to said C of $C{=}R^1$ and bonded to the 4 or 5 position of said Formula I to form a fused ring structure;

Y and Z are independently lower alkyl, substituted alkyl, a divalent unsaturated radical bonded to adjacent positions of said Formula I to form a fused ring structure, alkoxy, halogen, or nitro; and

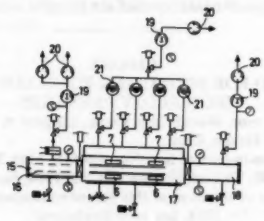
m and n are independently zero to 4.

4,544,468

METHOD OF AND APPARATUS FOR COATING SHAPED PARTS BY CATHODIC ATOMIZATION

Wolf D. Münz, Somborn, and Gerhard Hessberger, Karlstein, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 351,730, Feb. 24, 1982, Pat. No. 4,426,267. This application Jan. 19, 1984, Ser. No. 571,920
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107914
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 R **11 Claims**



1. A method of coating a part by cathodic atomication of target material, the part having a three-dimensional surface to be coated, comprising:

providing two, facing cathodic atomization devices for receiving the part to be coated in a discharge space therebetween, each cathodic atomization device having a target of the same material with a surface delimiting the discharge space, a cathode arrangement for producing a plasma cloud of the target material in the discharge space, and magnetic means producing a magnetic field which closes on the target for concentrating the plasma cloud of the target material in a zone at the target surface delimiting the discharge space; and

applying a voltage which is negative with respect to ground to the part to be coated in the discharge space sufficient to facilitate at least touching of the plasma clouds of the

target material from the cathodic atomization devices at the part to be coated in the discharge space.

4,544,469

ALUMINUM CELL HAVING ALUMINUM WETTABLE CATHODE SURFACE

Larry G. Boxall; William M. Buchta; Arthur V. Cooke, all of Baltimore; Dennis C. Nagle, Catonsville, and Douglas W. Townsend, Glen Burnie, all of Md., assignors to Commonwealth Aluminum Corporation, Bethesda, Md.

Filed Jul. 22, 1982, Ser. No. 400,762

Int. Cl.⁴ C25C *3/08, 7/02;* **C25B** *11/12*

U.S. Cl. 204—243 R **18 Claims**

1. In a cell for the electrolytic reduction of alumina to aluminum, said cell comprising a receptacle, at least one anodic surface, a cathodic surface, means for providing electrical power, means for the introduction of bath materials and alumina, and means for the removal of product aluminum, the improvement wherein said cathodic surface comprises a Refractory Hard Material in a carbonaceous matrix comprising carbonaceous filler having a particle size less than about 100 mesh and carbonaceous additive having a particle size greater than about 100 mesh, bonded by non-graphitized amorphous carbon, said matrix having a rate of ablation essentially equal to the rate of wear and dissolution of said Refractory Hard Material in the operating environment of said cell.

4,544,470

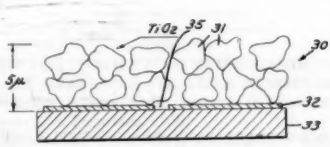
ELECTROCHEMICAL PHOTOCATALYTIC STRUCTURE

Robert E. Hetrick, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 31, 1984, Ser. No. 615,990

Int. Cl.⁴ C25B *1/00, 11/06*

U.S. Cl. 204—248 **7 Claims**



1. An electrochemical photocatalytic structure for photosensitizing chemical reduction-oxidation reactions including:

a substrate means for providing physical support for said structure;

a film of catalyst material deposited on said substrate means;

a porous layer of semiconductor powder adjacent said catalyst material, and adapted for photoactivity wherein said semiconductor powder layer has a porosity of about 50% to about 75% and has a grain size less than about 1 micrometer to 0.02 micrometer, at least some of said semiconductor powder grains are in contact with said film of catalyst material, and at least a portion of said film of catalyst material is uncovered by said semiconductor powder grains so as to be exposed for electrochemical reaction; and

said semiconductor powder including spaced grains of semiconductor material to provide a pore volume so as to pass a chemical reactant which is subjected to a photochemical reduction-oxidation reaction when said structure is illuminated with light having a wavelength with an energy above the electron bandgap energy of said semiconductor material so that both electron and hole carriers are created in said layer of semiconductor powder.

4,544,471

ELECTROLYTIC CELL WITH CATION EXCHANGE MEMBRANE HAVING HIGH EQUIVALENT WEIGHT COMPONENT

Raimund H. Silva, Hattingen, Fed. Rep. of Germany, and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 317,280, Nov. 2, 1981, Pat. No. 4,401,711, which is a continuation-in-part of Ser. No. 225,652, Jan. 16, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,508

Int. Cl.⁴ C25B *9/00, 13/08*

U.S. Cl. 204—252 **2 Claims**

1. In an electrolytic cell having an anode, a cathode, and a cation exchange membrane separating the anode and the cathode, the improvement wherein the cation exchange membrane consists essentialy of layers of

(a) fluorinated polymer with pendant side chains containing carboxyl groups,

(b) fluorinated polymer having pendant side chains containing sulfonyl groups and having an equivalent weight of about from 1100 to 1600 and at least about 200 units higher than layer (a), and

(c) fluorinated polymer having pendant side chains containing sulfonyl groups and having an equivalent weight that is about from 1000 to 1500 and at least about 100 units lower than layer (b), the layers being bonded together in the order specified.

4,544,472

ELECTRODE COATING AND COATED ELECTRODES

Frederick V. Reven, Homewood, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 627,173, Jul. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 484,829, Apr. 14, 1983, Pat. No. 4,477,579. This application Mar. 11, 1985, Ser. No. 710,517

Int. Cl.⁴ C25B *11/00*

U.S. Cl. 204—290 R **1 Claim**

1. A coated carbon electrode used in the manufacture of aluminum, the coating consisting essentially of prior to drying in percentages by weight:

a. 15–50% zinc chloride

b. 5–25% powdered alumina

c. 1–10% alkali metal hydroxide or carbonate

d. 0.05–5% of a suspending agent consisting essentially of starch as synthetic water-soluble polymers and xanthan gums

e. 0.05–5% surface active agent

f. balance water.

4,544,473

CATALYTIC ELECTROLYTIC ELECTRODE

Stanford R. Ovshinsky, Bloomfield Hills, and Krishna Sapru, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed May 12, 1980, Ser. No. 148,915

Int. Cl.⁴ C25B *11/04*

U.S. Cl. 204—292 **11 Claims**

1. A catalytic body comprising a composition having at least two vacuum deposited components and at one of said components comprising a transition metal element, said catalytic composition being in a substantially amorphous state, said composition having a local order non-equilibrium structural configuration resulting in a number of at least one desired type of catalytically active site interspersed throughout the bulk of the composition.

4,544,474

POROUS DIAPHRAGMS FOR ELECTROLYTIC CELLS HAVING NON-UNIFORM HYDROPHOBICITY

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 332,424, Dec. 21, 1981, Pat. No. 4,468,360. This application Aug. 2, 1984, Ser. No. 637,099
Int. Cl.[4] C25B *13/00*
U.S. Cl. 204—295 10 Claims

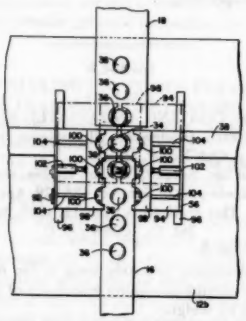
1. A porous diaphragm for an electrolytic cell for the electrolysis of alkali metal halides comprised of a thermoplastic support fabric impregnated with particles of a siliceous composition, said thermoplastic support fabric having an anode side, a cathode side opposite said anode side, and a thickness of at least 0.3 millimeters, said cathode side having a greater hydrophobicity than said anode side.

4,544,475

ELECTROCOATING APPARATUS

Robert E. Heffner, Lower Burrell, and John J. Davidson, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 463,689, Feb. 4, 1983, abandoned. This application Jun. 27, 1984, Ser. No. 625,178
Int. Cl.[4] C25D *13/14*
U.S. Cl. 204—300 EC 11 Claims



1. An apparatus for sequentially electrocoating a continuous stream of open-ended containers wherein an electrocoating medium is maintained in intimate contact with a container to be electrocoated while an electrical potential is applied to the container for electrodeposition of the electrocoating medium on surface areas thereof, said apparatus comprising:

at least one electrocoating cell;

infeed means cooperable with said at least one electrocoating cell for delivering such containers thereto for electrocoating thereof;

discharge means cooperable with said at least one electrocoating cell for receiving electrocoated containers therefrom;

said at least one electrocoating cell including a container receiving seat portion for supporting a container to be electrocoated, and further including a cover portion and a nozzle-probe portion which cooperate to enclose such a container when supported by said seat portion;

cell opening and closing means operable to move said cover and nozzle-probe portions with respect to said seat portion for opening said at least one electrocoating cell to discharge such a container and to receive another therein and for closing said at least one electrocoating cell to enclose such a received container therein;

transfer means cooperable with said at least one electrocoating cell and with said infeed and discharge means to sequentially transfer containers in such a continuous stream from said infeed means into juxtaposition with said seat portion, and to simultaneously transfer the preceding container in such stream from said seat portion to said discharge means, when said at least one electrocoating cell is open;

said transfer means including movable container engaging means which is operable to repetitively engage a plurality of adjacent containers in such a stream, advance such plurality of containers a predetermined incremental distance along a passline at a predetermined constant elevation, and disengage such plurality of containers;

said seat portion being movable transversely of said passline to respective container support and release positions in cooperation with said container engaging means to support a container juxtaposed therewith when such container is disengaged from said container engaging means;

means cooperable with said at least one electrocoating cell to deliver electrocoating medium thereinto when said at least one electrocoating cell is closed and for subsequently draining residual electrocoating medium therefrom prior to opening of said at least one electrocoating cell; and

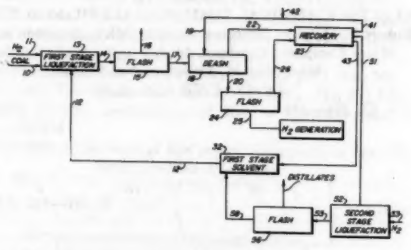
electrical means cooperable with said at least one electrocoating cell to apply such an electrical potential to a container enclosed herewithin.

4,544,476

COAL LIQUEFACTION AND HYDROGENATION

Raymond H. Long, Morristown, and Harvey D. Schindler, Fair Lawn, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Dec. 7, 1983, Ser. No. 559,096
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—8 LE 10 Claims



1. A two-stage process for the liquefaction of coal, comprising:

contacting coal with liquefaction solvent in a first stage coal liquefaction zone to produce a first effluent; hydrogenating at least a portion of the first effluent in a second stage to produce a second effluent comprising 850° F.− material and 850° F.+ material; recovering from the second effluent a (portion of the) first stream comprising 850° F.− material as product and a second stream comprising a mixture of 850° F.− material and 850° F.+ material; and directly employing said mixture, without additional hydrogenation, as at least a portion of the liquefaction solvent used in the coal liquefaction zone.

4,544,477

POLAR SOLVENT EXTRACTION AND DEDUSTING PROCESS

James L. Taylor, Naperville, Ill., assignor to Standard Oil Company and Gulf Oil Corporation, both of Chicago, Ill.

Filed Oct. 12, 1983, Ser. No. 541,154
Int. Cl.[4] C10G *1/00, 21/16, 21/06*
U.S. Cl. 208—11 R 40 Claims

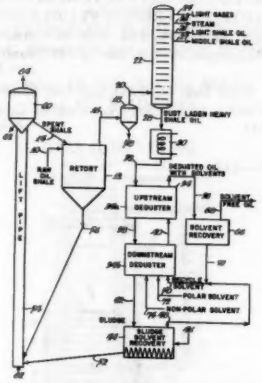
1. A process for dedusting synthetic oil, comprising the steps of:

injecting a polar solvent selected from the group comprising alcohols containing from 1 to 4 carbon atoms, into dust-

laden synthetic oil selected from the group consisting essentially of shale oil, tar sands oil, and tar sands bitumen, said dust-laden synthetic oil containing from about 1% to about 65% by weight of entrained particulates of dust consisting essentially of oil shale and tar sands;

injecting a non-polar solvent comprising alkanes containing from 3 to 9 carbon atoms into said dust-laden synthetic oil;

dissolving said dust-laden synthetic oil in said polar and non-polar solvents;



separating said dissolved dust-laden synthetic oil into a substantially dedusted phase and a dust-enriched phase;

settling said dust-enriched phase at a rate of at least 10 feet per hour;

said polar solvent having an affinity to produce substantial separation of said dissolved dust-laden synthetic oil and generally rapid settling of said dust-enriched phase; and

said non-polar solvent being capable of reducing the total amount of solvent necessary to dissolve said dust-laden synthetic oil.

4,544,478

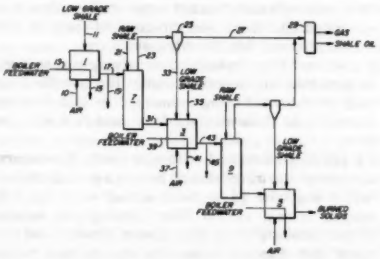
PROCESS FOR PYROLYZING HYDROCARBONACEOUS SOLIDS TO RECOVER VOLATILE HYDROCARBONS

Max D. Kelley, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 414,712, Sep. 3, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,639

Int. Cl.⁴ C10G *1/00*

U.S. Cl. 208—11 R **18 Claims**



1. A process for pyrolyzing a first particulate hydrocarbonaceous solid in a series of alternating heating zones and pyrolysis zones, which comprises:

(a) burning a first fraction of a second particulate hydrocarbonaceous solid which is leaner than said first hydrocarbonaceous solid in the presence of oxygen in a first heating zone, thereby heating a heat transfer solid to a temperature sufficient to pyrolyze the first hydrocarbonaceous solid;

(b) mixing at least a portion of the hot heat transfer solid from the first heating zone with a first fraction of the first hydrocarbonaceous solid in a first pyrolysis zone, thereby heating the first fraction of the first hydrocarbonaceous solid to a pyrolyzing temperature, whereby volatile hydrocarbons and pyrolyzed solid containing a carbonaceous residue are formed;

(c) recovering the volatile hydrocarbons from the first pyrolysis zone as product vapors, and withdrawing pyrolyzed solid and heat transfer solid from the first pyrolysis zone;

(d) burning a second fraction of the second hydrocarbonaceous solid and the carbonaceous residue remaining in the pyrolyzed solid from the first pyrolysis zone in the presence of oxygen in a second heating zone, thereby forming additional heat transfer solid;

(e) mixing at least a portion of the hot heat transfer solid from the second heating zone with a second fraction of the first hydrocarbonaceous solid in a second pyrolysis zone, thereby heating the second fraction of the first hydrocarbonaceous solid to the pyrolyzing temperature, whereby volatile hydrocarbons and pyrolyzed solid containing a carbonaceous residue are formed; and

(f) recovering the volatile hydrocarbons from the second pyrolysis zone as product vapors, and withdrawing pyrolyzed solid and heat transfer solid from the second pyrolysis zone.

4,544,479

RECOVERY OF METAL VALUES FROM PETROLEUM RESIDUA AND OTHER FRACTIONS

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 340,661, Jan. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 224,778, Jan. 13, 1981, Pat. No. 4,334,976, which is a continuation-in-part of Ser. No. 186,927, Sep. 12, 1980, Pat. No. 4,317,711. This application Dec. 1, 1983, Ser. No. 556,808

Int. Cl.⁴ C10G *9/00, 25/06, 25/12*

U.S. Cl. 208—106 **18 Claims**

1. A process for heavy hydrocarbon oil demetallation and metals recovery which comprises:

(a) heating an admixture of 70 to 95 wt % heavy hydrocarbon oil containing at least one metal selected from the group consisting of vanadium and nickel and 5 to 30 wt % particulate coal under visbreaking conditions to produce a visbroken liquid with a reduced metals content containing solids; and

(b) recovering from the visbroken liquid an oil fraction with reduced metal content and a solids fraction containing at least about 30% of the metal in said heavy hydrocarbon oil.

4,544,480

LOW RESIDENCE TIME SOLID-GAS SEPARATION PROCESS

Robert J. Gartside, Auburndale, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Division of Ser. No. 165,781, Jul. 3, 1980, Pat. No. 4,348,364, which is a continuation-in-part of Ser. No. 55,148, Jul. 6, 1979, Pat. No. 4,288,235. This application Jul. 1, 1982, Ser. No. 394,107

The portion of the term of this patent subsequent to Sep. 8, 1999, has been disclaimed.

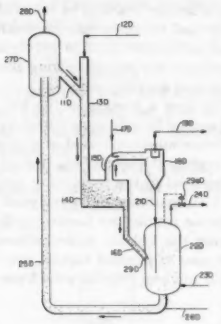
Int. Cl.⁴ B01D *45/06*

U.S. Cl. 208—127 **16 Claims**

7. In a TRC process wherein the temperature in the reaction chamber is between 1300° and 2500° F. and wherein the hydro-

carbon fluid feed or the hydrodesulfurized residual oil along with the entrained inert solids and the diluent gas are passed through the reaction chamber for a residence time of 0.05 to 2 seconds, the improvement comprising a method for separating by centrifugal force particulate solids from a dilute mixed phase stream of gas and solids, the method comprising the steps of:

adding the mixed phase stream to a chamber having a flow path of essentially rectangular cross section from an inlet of inside diameter D_i disposed normal to the flow path, said flow path having a height H equal to D_i or 4 inches, whichever is greater, and a width W greater than or equal to 0.75 D_i but less than or equal to 1.25 D_i,



disengaging solids from gas by centrifugal force within said chamber along a bed of solids found at a wall opposite to the inlet as the gas flows through said flow path, the gas changing direction 180° from the inlet, and the solids being projected 90° from the inlet toward a solids outlet,

withdrawing the gaseous portion of the inlet stream from a gas outlet, disposed 180° from the inlet, the gas portion containing about 20% residual solids, said gas outlet located between the solids outlet and said inlet, the gas outlet being at a distance no greater than 4 D_i from the inlet as measured between respective centerlines, and

withdrawing the solids by gravity through the solids outlet.

4,544,481

SUPPORTED CARBON-CONTAINING MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS THEIR PREPARATION AND USE

Robert L. Seiver, Baton Rouge, La., and Russell R. Chianelli, Sommerville, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 400,004, Jul. 20, 1982, Pat. No. 4,431,747. This application Nov. 14, 1983, Ser. No. 551,595

Int. Cl.⁴ C10G *45/04, 45/08*

U.S. Cl. 208—215 **10 Claims**

1. A process for hydrotreating a hydrocarbon feed which comprises contacting said feed at hydrotreating conditions with a supported carbon-containing molybdenum sulfide and tungsten sulfide hydrotreating catalysts formed by the steps comprising

compositing a preselected quantity of a porous, refractory inorganic oxide with a salt characterized by the formula

$$B_x[MO_yS_{4-y}]$$

where B is an organo or hydrocarbyl substituted diammonium ion, an organo or hydrocarbyl substituted ammonium ion or quaternary ammonium ion, or an ionic form of a cyclic amine containing one or more basic N atoms, x is 1 where B is an organo or hydrocarbyl substituted diammonium ion, or 2 where B is an organo or hydrocarbyl substituted ammonium or quaternary ammonium ion or ionic form of a cyclic amine containing one or more basic N atoms, M is molybdenum or tungsten, and y is 0, or a fraction or whole number ranging up to 3, and

heat decomposing the salt of said catalyst precursor composite in the presence of hydrogen, hydrocarbon and sulfur to form said supported carbon-containing molybdenum sulfide or tungsten sulfide hydrotreating catalyst.

4,544,482

APPARATUS FOR EXTRACTING MAGNETIZABLE PARTICLES FROM A FLUID MEDIUM

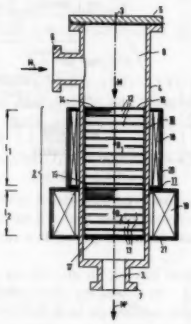
Günter Rupp, Rathsberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,662

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247522

Int. Cl.⁴ B01D *35/06*

U.S. Cl. 210—222 **11 Claims**



1. Apparatus for high gradient magnetic separation of magnetizable particles from a flowing, fluid medium comprising, in combination:

(a) a first filter housing part having means defining a first inlet and a first outlet for said fluid medium;

(b) a plurality of first wire nets made of non-corroding, ferromagnetic material each having a predetermined mesh width and wire gauge, said first wire nets being arranged in said first filter housing part substantially perpendicularly to the direction of flow of said fluid medium and disposed relatively closely, one behind the other, as viewed in said direction of flow;

(c) means for generating a first substantially homogeneous magnetic field with a first flux density in the region of said first wire nets and directed substantially either in parallel or antiparallel with said direction of flow of said fluid medium in said first filter housing part;

(d) a second filter housing part having means defining a second inlet and a second outlet for said fluid medium, said second inlet being connected to said first outlet to receive said fluid medium from said first filter housing part;

(e) a plurality of second wire nets made of noncorroding, ferromagnetic material each having a predetermined mesh width and wire gauge, said second wire nets being arranged in said second filter housing part substantially perpendicularly to the direction of flow of said fluid medium and disposed relatively closely, one behind the other, as viewed in said direction of flow; and

(f) means for generating a second substantially homogeneous magnetic field with a second flux density in the region of said second wire nets and directed substantially either in parallel or antiparallel with said direction of flow of said fluid medium in said second filter housing part;

wherein said second flux density of said second magnetic field is greater than said first flux density of said first magnetic field, and

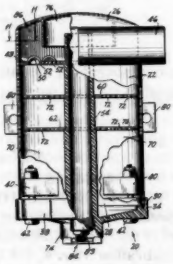
wherein the wire gauge of said first wire nets, at least in the vicinity of said first inlet where said fluid medium enters said first filter housing part, is heavier than the wire gauge of said second wire nets, at least in the vicinity of said second outlet where said fluid medium exits said second filter housing part.

4,544,483

DYNAMIC, REVERSE-FLOW OIL PURIFIER DEVICE

Ernest P. Arvai, Hamden, Conn., assignor to Puratrol, Inc., Bridgeport, Conn.

Filed Mar. 12, 1984, Ser. No. 588,623
Int. Cl.[4] B01D *29/34*
U.S. Cl. 210—316 **18 Claims**



1. A low-cost, mass-produced, reverse-flow oil purifier device utilizing reverse internal currents in a contained oil mass to remove impurities or water from oil fed to the device as from a spill or an oil supply that is circulating in the lubrication or fuel or other system of a piece of equipment, comprising in combination:

(a) a sealed housing having upper and lower interfitting parts, said upper part having a top wall and an upper inside wall, and said lower part having a bottom wall,

(b) said upper housing part having an oil inlet port adapted to direct the entering oil along said upper inside wall whereby the latter imparts

a swirling movement to the oil, said upper inside wall tending to direct said entering oil in a circular path,

(c) a straight open-top-end and open-bottom-end oil discharge standpipe attached to and supported by the bottom wall of the lower housing part and extending upward therefrom to a point adjacent the top wall of the upper housing part,

(d) guide means comprising a plurality of thin, spaced-apart perforated plates supported in vertically spaced relation by and surrounding said standpipe, for guiding said swirling entering oil downward into the lower portion of the housing and simultaneously reducing the swirling movement thereof whereby a settling of impurities from said reduced-swirl oil can occur in said lower housing part,

(e) said guide means enabling oil which is subject to said settling action in the lower housing part to pass upward around and closely adjacent the standpipe to the open top end thereof, thereby to ultimately flow downward in and through the standpipe and to be discharged from the bottom end thereof, and

(f) an inverted cup means supported by the top wall of the upper housing part and extending downward toward and past the top end of the standpipe, tending to keep the swirling inlet oil separated from the rising, settle-purified discharge oil which latter is entering the open top end of the standpipe, said cup means having a bottom rim disposed at a level above the bottom area of the oil inlet port and below the top end of the standpipe and said standpipe being free of and unattached to said inverted cup means, and said inverted cup means having a wall which is only partially interposed between the open top end of the standpipe and the oil inlet port whereby a direct but restricted path for flow exists between said open top end and a portion of said oil inlet port, the upper portions of said inverted cup means defining a confined area for the rising, settle-purified oil which is to be discharged, said confined area being disposed above and in surrounding relation to the open top end of the standpipe, thus to minimize cross flow between the oil inlet port and the standpipe.

4,544,484

REVERSE OSMOSIS MEMBRANE QUENCHING

Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1983, Ser. No. 507,897
Int. Cl.[4] B01D *13/00;* **B29D** *27/00*
U.S. Cl. 210—500.2 **9 Claims**

1. A process for preparing permselective membranes comprising the steps of casting a film or hollow fiber from a solution including: (a) synthetic organic nitrogen-linked aromatic polymer represented by the formula:

$$-(LR)_2-$$

where

(1) each L independently is a divalent linking group of the formula $-(D_iE_jD_kE_lD_m)-$ wherein

(i) D is

and E is

or vice versa: each X independently is O or S; each Z independently is H, lower alkyl, or phenyl, provided that at least about $\frac{1}{4}$ of the Z's in the polymer are H; and all non-terminal

occur in pairs;

(ii) i and j each represent the numerals 1 or 2, k, l, and m each represent the numerals 0, 1, or 2; provided that if $l=0$; then $m=0$; and if $k=0$, then $l=0$; and further that $i+j+k+l+m \leq 8$;

(2) each R independently is a divalent organic radical, both of whose terminal atoms are carbon atoms, at least about $\frac{1}{2}$ of all such terminal atoms bonded to

and at least about $\frac{3}{4}$ of all such terminal atoms bonded to

and the L links being members of aromatic nuclei; and such that

(i) $(N_R)/(\bar{s})$ is less than about 10,

(ii) f_M is less than about 1/5, and

(iii) P.I. is less than about 1/500,

where:

$N_R = N_R^* - 10N_1 - N_H$

N_R^* = (number of atoms in R, exclusive of H-atoms) 50

N_1 = number of ionic groups in R

N_H = number of H-bonding units contributed by polar groups in R

$\bar{N}_R$ = average value of N_R for the polymer,

$\bar{s} = \frac{1}{2}$[(number of

groups in L)+1]

$\bar{s}$ = average value of s for the polymer

$$f_m = \frac{\text{(number of single-strand } -M\text{-links in the polymer/chain)}}{\text{(total number of atoms, exclusive of H-atoms in polymer chain)}}$$

M = any atom in R linking the polymer chain solely through two single bonds,

$$P.I. = \frac{\text{(total number of pendent ionic groups in the polymer)}}{\text{(polymer molecular weight)}};$$

(3) n is an integer sufficiently large to provide film-forming molecular weight; and

(4) the polymer has a solubility of at least about 10% by weight in a medium consisting of 0–3% by weight of lithium chloride in a solvent selected from the group consisting of dimethylacetamide, dimethyl sulfoxide, N-methyl pyrrolidone, hexamethyl phosphoramide, and mixtures thereof at 25° C.; and (b) organic solvent for the polymer; contacting the cast film or hollow fiber with an aqueous quenching liquid for a period of about from 5 seconds to 15 minutes, the quenching liquid comprising about from 5 to 50 weight percent of at least one polar liquid selected from the group consisting of carbonyl compounds of the general formula

wherein A is H, NH_2, CH_3, or CH_2CH_3 and B is OH, NH_2, or CH_3; and then immersing the quenched film or hollow fiber in water for a time necessary to extract substantially all of the polar liquid from the film or hollow fiber.

9. A semipermeable membrane resulting from the process of claim 1.

4,544,485

CHROMATOGRAPHIC METHOD AND MEANS

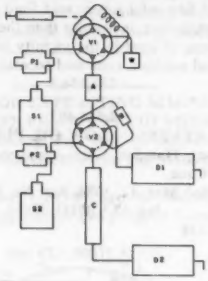
Thomas C. Pinkerton, and Helene I. Hagestam, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 31, 1984, Ser. No. 646,153

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—502.1 **19 Claims**

1. An internal surface reverse phase packing material for liquid chromatographic columns which comprises a porous support having a pore size sufficiently small to prevent the entry of proteinaceous materials into the said packing material, a hydrophobic partitioning phase bonded only to the internal surface thereof, and a hydrophilic partitioning phase bonded to the external surface thereof, whereby proteinaceous substances in an analyte mixture are rejected by the said packing material,



while hydrophobic components of the said analyte mixture are adsorbed and retained in the said packing material.

4,544,486

CYCLONE SEPARATOR

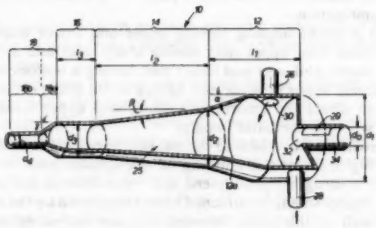
Noel Carroll, Sherbrooke Rd., Sherbrooke, Victoria, Australia

Continuation-in-part of Ser. No. 449,395, Dec. 13, 1982, Pat. No. 4,464,264. This application Mar. 4, 1983, Ser. No. 472,015

Claims priority, application Australia, Mar. 4, 1982, PF2973; Mar. 11, 1982, PF3061; May 14, 1982, PF4016; May 14, 1982, PF4017; Aug. 10, 1982, PF5314

Int. Cl.[4] B04C *5/081*

U.S. Cl. 210—512.1 **9 Claims**



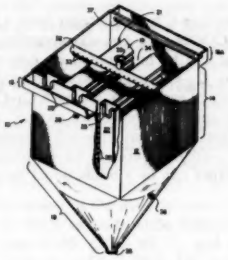
1. A cyclone separator comprising elements designed, sized and arranged for treating an oil-water mixture for separating the more dense water component from the less dense oil component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order and having diameters d_1, d_2 and d_3 respectively, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet, said overflow outlet being in the form of a stepped bore including: a first bore portion having a diameter of sufficient size to facilitate the preclusion of blocking therein, the first bore portion being adjacent the first cylindrical portion and a second bore portion of lesser diameter than the first bore portion the diameter of the second bore portion being sufficiently large to permit continuous operation of the overflow outlet, the second bore portion being further from the first cylindrical portion.

4,544,487

CLARIFIER/THICKENER

Milovan A. Bosnjak, 8318-A Greenslope, Austin, Tex. 78759

Filed Nov. 8, 1982, Ser. No. 439,838
Int. Cl.[4] B01D *21/10*
U.S. Cl. 210—522 **19 Claims**



1. In a clarifier of the type in which a stacked array of settling compartments is mounted substantially vertically within a vessel to provide exterior of said array along its entire vertical height within said vessel a flow stream of a mixture of a carrier liquid and suspended solids so that each said settling compartment receives a mixture of carrier liquid and suspended solids directly from said flow stream, the improvement comprising:

the individual settling compartments within said stacked array, each being defined by a back plate, opposing side plates, a top plate and a bottom plate, cooperatively assembled to receive the mixture directly from said flow stream through an entryway opposite said back plate, and to receive substantially all of said carrier liquid at said back plate under clarifying flow conditions so that solids settle towards said bottom plate and then pass outwardly through said entryway to join said flow stream; and

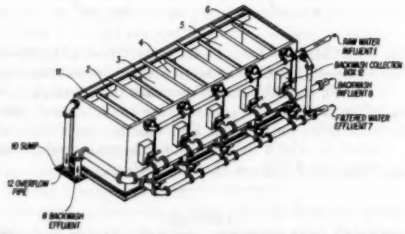
means for withdrawing said clarified liquid from a zone adjacent said back plate at a controlled rate.

4,544,488

AIR STRIPPING/ADSORPTION PROCESS FOR REMOVING ORGANICS FROM WATER

Robert P. O'Brien, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jul. 5, 1984, Ser. No. 628,092
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—664 **11 Claims**



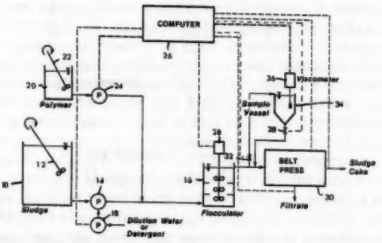
1. A process for removing volatile and non-volatile organic compounds from water comprising: (1) injecting said water into an induced draft air stripper through spray nozzles, thereby inducing air into said air stripper; (2) allowing mixing of said water and air to occur in said air stripper, thereby causing stripping of volatile compounds from said water by said air, and then allowing the air containing said volatile compounds to exit said air stripper to atmosphere; and (3) passing the effluent water from said air stripper through a carbon adsorption bed for removal of non-volatile organic compounds.

4,544,489

PROCESS AND APPARATUS FOR CONTROLLED ADDITION OF CONDITIONING MATERIAL TO SEWAGE SLUDGE

Herbert W. Campbell, Dundas, and Phillip J. Crescuolo, Burlington, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jul. 2, 1984, Ser. No. 626,799
Int. Cl.[4] C02F *1/54*
U.S. Cl. 210—709 **20 Claims**



1. A process for the controlled addition of dewatering conditioning polymer material to a sewage sludge to produce a mixture thereof comprising the steps of:

(a) measuring with a viscometer in a quantity of the sludge/-material mixture the value of the shear stress in the said quantity of the mixture to determine the existence or not of a predetermined maximum in the value of the measured shear stress representing a measured shear stress yield value;

(b) in the absence of detection of such a predetermined maximum value increasing the rate of addition of conditioning polymer material to the mixture;

(c) upon the detection of such a predetermined maximum value, measuring the rate of subsequent decrease of the measured shear stress immediately following the maximum value; and

(d) increasing or decreasing or maintaining the rate of addition of conditioning polymer material respectively as the rate of decrease is less than, or more than, or about equal to a predetermined rate of said subsequent decrease.

4,544,490

METHOD AND SYSTEM FOR RECOVERING COAL FINES FROM PIPE LINE COAL SLURRY

Paul R. Erickson, Glendale, and Kenneth A. Pietila, Milwaukee, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.

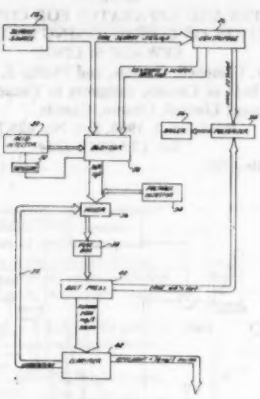
Filed Jan. 9, 1984, Ser. No. 569,135
Int. Cl.[4] B01D *37/00*
U.S. Cl. 210—713 **11 Claims**

1. A method for thoroughly dewatering primary pipeline coal slurry which comprises coarsely and finely ground coal particles to recover for combustion substantially all of the suspended coal particles in said primary slurry and also to recover the water in which said particles were suspended in substantially clear condition, comprising:

(a) in a primary slurry dewatering apparatus, separating said primary pipeline slurry into a secondary slurry comprising a liquid fraction and including a substantial portion of said finely ground coal particles, and a combustible cake fraction containing said coarsely ground coal particles;

(b) blending a portion of said primary slurry into said secondary slurry from the primary dewatering apparatus to create a concentrated heterogenous mixture of coarsely

ground and finely ground combustible coal particles which will be readily recoverable from a secondary slurry dewatering apparatus;



(c) filtering the water from said blend on said secondary slurry dewatering apparatus to separate said blend into a combustible cake of combined coarse and fine coal particles and a filtrate having a solids content of less than 1.0%.

4,544,491

RECOVERY OF HYDROCARBON OIL FROM FILTER CAKES

William H. Tyson, Moraga, and Frank A. Stuart, San Rafael, both of Calif., assignors to Claypro Associates, San Francisco, Calif.

Filed Aug. 24, 1983, Ser. No. 526,011

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[4] **B01D** *37/00*; **C02F** *1/00*

U.S. Cl. 210—772 **10 Claims**

1. In a process for recovering hydrocarbon oils and hydrocarbon oils containing dissolved additives from filter cakes produced by filtering such oils using a siliceous filter aid by contacting said filter cakes with an aqueous release agent selected from the group consisting of water solutions of an acid acting material and water solutions of a base acting material, the improvement which comprises:

(a) mixing the filter cake with about 0.5 cc to about 5.0 cc of release agent per gram of filter cake while maintaining the filter cake and added release agent at temperature above about 180° F.;

(b) maintaining the mixture resluting from step (a) at a temperature above 150° F. until an oil phase separates, and

(c) separating the oil phase.

4,544,492

LUBRICANT COMPOSITIONS

Horst Zinke, Ernsthofen, Fed. Rep. of Germany, and Rolf Schumacher, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 1, 1984, Ser. No. 605,947

Claims priority, application Switzerland, May 9, 1983, 2525/83

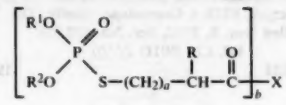
Int. Cl.[4] **C10M** *1/48*

U.S. Cl. 252—32.7 E **5 Claims**

1. A lubricant composition which comprises

(a) a mineral oil, a synthetic oil or a mixture of said oils, and

(b) 0.05 to 5% by weight, based on component (a), of at least one compound of formula I



(I)

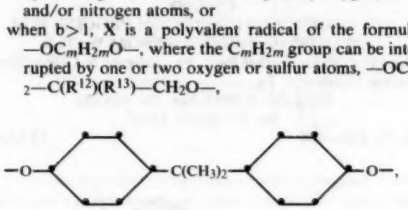
in which a is 0 or 1, b is an integer from 1 to 6, R is —H, —CH_3, —COOH, C_2–C_{13}-alkoxycarbonyl where the alkyl radical can be interrupted by one or two oxygen atoms, or is C_6–C_{13}-cycloalkoxycarbonyl; R^1 and R^2, independently of each other, are each C_3–C_{12}-alkyl which can be interrupted by one or two oxygen or sulfur atoms, C_5–C_{12}-cycloalkyl, phenyl, phenyl substituted by one to three C_1–C_{12}-alkyl groups; or C_7–C_9-phenylalkyl; or R^1 and R^2 together can be a bifunctional radical of the formula II

(II)

where n is 0 or 1, R^3, R^4, R^5 and R^6, independently of each other, are each —H, C_1–C_4-alkyl, C_5–C_{12}-cycloalkyl or phenyl, and R^7 and R^8, independently of each other, are each —H, C_1–C_4-alkyl, phenyl, —NO_2, C_2–C_{19}-alkoxycarbonyl or C_6–C_{13}-cycloalkoxycarbonyl, or R^7 and R^8, together with the carbon atom to which they are bonded, are a cyclopentenyl or cyclohexenyl ring, and

when b is 1, X is —OR^9 or —$N(R^{10})(R^{11})$, where R^9 is —H, C_1–C_{22}-alkyl, C_5–C_{12}-cycloalkyl or phenyl, R^{10} and R^{11}, independently of each other, are each —H, C_1–C_{22}-alkyl, said alkyl interrupted by one or two oxygen atoms, C_2–C_{22}-alkenyl or C_5–C_{12}-cycloalkyl; or R^{10} and R^{11}, together with the nitrogen atom to which they are bonded, are a C_2–C_{22}-alkylene or C_2–C_{22}-alkenylene ring which can be interrupted by oxygen, sulfur and/or nitrogen atoms, or

when b>1, X is a polyvalent radical of the formulae —$OC_mH_{2m}O$—, where the C_mH_{2m} group can be interrupted by one or two oxygen or sulfur atoms, —$OCH_2C(R^{12})(R^{13})CH_2O$—,



(—$OCH_2)_3C—R^{14}$, $(—OCH_2)_4C$ $(—OCH_2)_3C—CH_2—O—CH_2—C(CH_2O—)_3$, where m is an integer from 2 to 40, and R^{12} and R^{13} are each C_1–C_4-alkyl, C_2–C_9-alkoxycarbonyl, C_6–C_{13}-cycloalkoxycarbonyl, phenyl or —NO_2, or R^{12} and R^{13}, together with the carbon atom to which they are bonded, are a cyclopentenyl ring, and R^{14} is —CH_3 or —C_2H_5.

4,544,493

NEUTRALIZATION OF ORGANIC SULFURIC OR SULFONIC DETERGENT ACID TO PRODUCE HIGH SOLIDS CONCENTRATION DETERGENT SALT

Salvatore J. Silvis, Staten Island, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,570

Int. Cl.[4] **C07C** *141/04*

U.S. Cl. 252—89.1 **18 Claims**

1. A process for neutralizing organic sulfuric or sulfonic acid(s) or a mixture thereof, suitable for use as a detergent in

neutralized salt form, which comprises feeding a liquid solution or slurry of neutralizing agent(s) and at least one organic acid containing a single sulfuric acid or sulfonic acid moiety and a higher lipophilic alkyl group of 8 to 20 carbon atoms, to a wall of a cylindrical reaction zone, the ratio of said neutralizing agent to said acid being approximately stoichiometric and the amount of water in said neutralizing agent being sufficiently low so that the neutralized detergent will have a solids content above the gel region; forming a film of said organic acid and said neutralizing agent on a wall of such zone; contacting said film with means which continuously produce agitating and wall wiping actions in said reaction zone to react said neutralizing agent(s) and said organic acid(s) by continuously removing and redepositing material on said wall while limiting the film buildup in said zone as said contacting means move said film through said reaction zone, said means comprising a plurality of scraper blades attached to a rotating shaft; continuing said contacting as the material moves through said zone in from one to thirty seconds while maintaining the temperature in said zone at 40° C. to 70° C., and removing the neutralized product from said reaction zone in the form of a pumpable aqueous medium containing a solids concentration of neutralized organic sulfate or sulfonate which is in the range of 50% to 85% by weight.

4,544,494

HOMOGENEOUS LAUNDRY DETERGENT SLURRIES CONTAINING AMPHOTERIC SURFACE-ACTIVE AGENTS

Gale D. Downey, Pennington, N.J., and Charles E. Jones, Yardley, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 12, 1984, Ser. No. 599,391

Int. Cl.⁴ C11D *17/06*

U.S. Cl. 252—135 **15 Claims**

1. A stable, homogeneous, aqueous detergent slurry consisting essentially of:

a. a sodium polyphosphate in amounts of from about 14 weight percent to about 30 weight percent,

b. an alkali metal hydroxide or alkali metal salt selected from the group consisting of sodium carbonate, sodium hydroxide, sodium bicarbonate, potassium hydroxide, potassium carbonate, potassium bicarbonate, sodium sesquicarbonate, potassium sesquicarbonate, sodium borate, potassium borate, potassium sulfate, sodium sulfate, sodium chloride, potassium chloride, sodium orthophosphate, tetrasodium pyrophosphate and tetrapotassium pyrophosphate in amounts of from about 1 weight percent to about 5 weight percent,

c. a soluble, anionic surface-active agent selected from the group consisting of alkyl-, alkylaryl-, alkene-sulfate salts and alkyl-, alkylaryl-, and alkene-sulfonate salts,

d. a soluble, anionic surface-active agent which is an alkali metal alcohol alkoxylate sulfate in amounts of about 0 to about 3 weight percent,

e. sodium carboxymethylcellulose in amounts of from about 0.1 to about 1 weight percent,

f. an amphoteric surface-active agent selected from the group consisting of N-coco β-amino propionic acid; N-lauryl-, myristyl β-amino propionic acid; disodium N-tallow β-iminodipropionate; N-coco β-amino butyric acid; and coco betaine in amounts of about 0.5 to about 5 weight percent,

g. said sodium polyphosphate being present in part as insoluble particles having an average diameter of about 1 to 10 microns, and

h. the total amount of the above surface-active agents in said detergent slurry being from about 13 weight percent to about 20 weight percent.

4,544,495

HIGH FOAMING LIQUID SHAMPOO COMPOSITION

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 10, 1981, Ser. No. 291,265

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.⁴ C11D *1/722*

U.S. Cl. 252—174.21 **3 Claims**

1. A high foaming liquid shampoo comprising 2 to 25 percent by weight of a nonionic surfactant, 0.01 to 8 percent by weight of an acid suitable for use in shampoos, 0.01 to 8 percent by weight of a foam boosting and foam stabilizing agent, 2 to 40 percent by weight of an amphoteric surfactant, 0.01 to 8 percent by weight of an additional thickening agent and 30 to 80 percent by weight of water, the nonionic surfactant being a cogeneric mixture of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms; the compounds being characterized in that all of the oxybutylene groups are present in polyoxybutylene chains that are attached to the organic radical at the site of a reactive hydrogen atom thereby constituting a polyoxybutylene polymer; the oxyethylene groups being attached to the polyoxybutylene polymer in polyoxyethylene chains, the average molecular weight of the polyoxybutylene polymers in the mixture being at least 500, as determined by hydroxyl number, and the oxyethylene groups present constituting 65 to 80 percent, by weight, of the mixture.

4,544,496

LIGHT-COLLECTING SYSTEM USING COUMARIN DERIVATIVES AS ENERGY CONVERTERS

Uwe Claussen, Leverkusen, and Horst Harnisch, Much, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

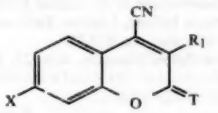
Continuation of Ser. No. 406,622, Aug. 9, 1982, abandoned, which is a continuation of Ser. No. 176,383, Aug. 8, 1980, abandoned. This application Jun. 6, 1983, Ser. No. 500,795

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1979, 2934541; Dec. 22, 1979, 2952228

Int. Cl.⁴ C09K *11/02*

U.S. Cl. 252—301.35 **12 Claims**

1. In a light-collecting system comprising an emission surface and an absorption surface wherein the ratio of the emission surface to the absorption surface is 1:50–2,000, said light-collecting system comprising a medium which has a greater optical density than its surrounding and which has at least one center capable of fluorescence wherein said center contains an energy converter, the improvement wherein said energy converter comprises a coumarin derivative of the formula



(I)

in which

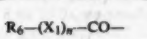
T denotes O, in which

R_1 denotes a carbocyclic or heterocyclic 5-membered or 6-membered ring bonded via a C atom, or a 5-membered or 6-membered heterocyclic ring which is bonded via a N atom and is asymmetrical to an axis placed through the coumarin/N-heterocyclic bond, it being possible for the said 5-membered or 6-membered rings to carry non-ionic substituents and for an optionally substituted benzene ring or an optionally substituted naphthalene ring to be fused to the said rings;

X signifies

or $—OR_2'$, in which

R_2 represents hydrogen, alkyl, cycloalkyl, aralkyl or aryl, it being possible for the said hydrocarbon radicals to be substituted, and R_3, in addition to having the definitions given for R_2, also signfies a radical of the formulae



or

in which

R_6 and R_7 represent alkyl, cycloalkyl, aryl or aralkyl, it being possible for the said hydrocarbon radicals to be substituted,

X_1 represents NH or O and

n represents 0 or 1, or

R_2 and R_3 together with the N atom and optionally with the inclusion of further hetero-atoms form a 5-membered or 6-membered ring, it being possible for this ring to carry non-ionic substituents and for an optionally substituted benzene ring or an optionally substituted naphthalene ring to be fused thereto, or R_2 and R_3 together form a di-unsaturated radical of the formula

in which

R_8 represents optionally substituted alkyl, optionally substituted aryl, optionally substituted cycloalkyl or optionally substituted aralkyl, and

R_2' signifies optionally substituted alkyl, alkenyl, optionally substituted cycloalkyl, optionally substituted aryl or optionally substituted aralkyl and a homopolymer or copolymer of acrylic acid or its derivatives or a polycarbonate.

4,544,497

LIQUID CRYSTAL MATERIALS CONTAINING SUBSTITUTED BICYCLO(2,2,2)OCTANES

Hilal M. Abdullah, Waziria, Iraq; Jennifer Constant, Powick, England; George W. Gray, Cottingham, England; Damien G. McDonnell, Malvern, England, and Kenneth J. Toyne, Hull, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

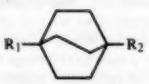
Filed Jan. 25, 1984, Ser. No. 573,716

Claims priority, application United Kingdom, Jan. 28, 1983, 8302395

Int. Cl.[4] G02F *1/13*; C09K *3/34*

U.S. Cl. 252—299.5 **7 Claims**

1. A liquid crystal composition which comprises a mixture of compounds and which includes at least one additive compound of Formula I as follows:



I

wherein R_1 represents an alkyl group, R_2 represents an alkyl or alkoxy group or hydrogen and

represents a 1,4-disubstituted bicyclo(2,2,2)octane ring.

4,544,498

PEARLESCENT LIQUID SUSPENSION

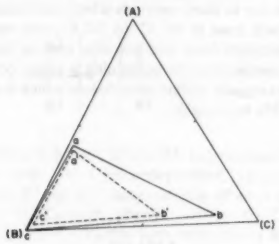
Toshio Suzuki, Ichikawa, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,299

Claims priority, application Japan, Jul. 5, 1983, 58-120990

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—547 **6 Claims**



1. A pearlescent liquid suspension comprising as essential ingredients (A) a cationic surface active agent, (B) a higher alcohol, and (C) an alpha-mono(methyl-branched alkyl) glyceryl ether, the total amount of these ingredients being from 1 to 40 wt %, mixing ratios of (A), (B) and (C) lying within an area surrounded by lines obtained by connecting the following points a, b and c on the triangular coordinate of the ternary system of the sole FIGURE attached.

a [(A)=40.0, (B)=58.0, (C)=2.0]

b [(A)=4.0, (B)=16.0, (C)=80.0]

c [(A)=0.2, (B)=99.7, (C)=0.1]

4,544,499

FIXATION BY ANION EXCHANGE OF TOXIC MATERIALS IN A GLASS MATRIX

Danh C. Tran, Rockville, Md.; Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Joseph H. Simmons; Catherine J. Simmons, both of Bethesda, Md., and Nicholas Lagakos, Silver Spring, Md., assignors to Pedro B. Macedo, Bethesda, and Theodore A. Litovitz, Annapolis, both of, Md.

Continuation of Ser. No. 65,752, Aug. 10, 1979, Pat. No. 4,333,847, which is a continuation-in-part of Ser. No. 34,567, Apr. 30, 1979, Pat. No. 4,312,774, which is a continuation-in-part of Ser. No. 959,220, Nov. 9, 1978, abandoned. This application Jun. 7, 1982, Ser. No. 386,215

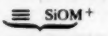
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.[4] G21F *9/16*

U.S. Cl. 252—629 **10 Claims**

1. A process for separating and immobilizing radioactive anions from a liquid containing same comprising contacting said liquid with a porous silica glass or gel comprising at least 82 mol percent silica having interconnected pores and non-radioactive cationic polyvalent metals bonded to silicon of the glass or gel through divalent oxygen linkages on the internal surfaces of said pores and non-radioactive anions ionically bonded to said cationic polyvalent metals and displaceable by

said radioactive anions, to provide a distribution of radioactive anions internally bonded within the pores to silicon of the glass or gel through a cationic polyvalent metal and a divalent oxygen linkage as represented by the formula:



Wherein M^+ are said cationic polyvalent metals.

4,544,500

SYNTHETIC FOOT AND MOUTH DISEASE ANTIGEN

James L. Bittle, San Diego, and Richard A. Lerner, La Jolla, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 368,308, Apr. 14, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 682,819

Int. Cl.⁴ C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. An antigen comprising a foot-and-mouth disease virus mono-specific synthetic antigenic determinant peptide having about twenty amino acids corresponding to a twenty amino acid sequence of the foot-and-mouth disease virus protein VP_1 in the 130 to 160 region.

4,544,501

BIS(2,2-DIMETHYL-1-AZIRIDINYL)PHOSPHINIC AMIDES FOR USE IN THE TREATMENT OF TUMORS

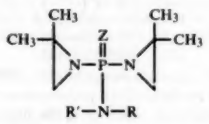
Thomas J. Bardos, Snyder; Michael E. Perlman, Bronxville, and Joan E. MacDiarmid, Amherst, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 367,338, Apr. 12, 1982,. This application Apr. 12, 1983, Ser. No. 484,213

Int. Cl.⁴ C07D *203/06;* **A61K** *31/395*

U.S. Cl. 260—239 EP **6 Claims**

1. A compound having the formula:



wherein R and R′ are independently hydrogen, or substituted alkyl of up to about 10 carbon atoms, wherein each substituent is selected from the group consisting of amine and alkoxy, and Z is oxygen provided at least one of R or R′ is substituted alkyl.

4,544,502

CHIRAL SYNTHESIS OF THIENAMYCIN FROM D-GLUCOSE

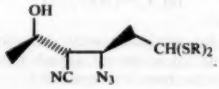
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 464,185, Feb. 7, 1983, Pat. No. 4,448,976, which is a division of Ser. No. 248,177, Mar. 30, 1981, Pat. No. 4,384,998. This application Jan. 25, 1984, Ser. No. 573,742

Int. Cl.⁴ C07C *117/00, 121/86*

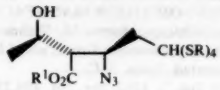
U.S. Cl. 260—349 **1 Claim**

1. A compound selected from the group consisting of



and

-continued



wherein R and R^1 are each selected from alkyl having 1–6 carbon atoms.

4,544,503

PROCESS FOR PRODUCING ACYLOXYBENZENESULFONATE SALTS

C. Bernard Berry, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 1, 1983, Ser. No. 528,456

Int. Cl.⁴ C07C *143/90;* **C11D** *1/28*

U.S. Cl. 260—402 **17 Claims**

1. A method of preparing alkali metal salts or alkaline earth metal salts of acyloxybenzenesulfonate by reacting an alkali metal salt or an alkaline earth metal salt of hydroxybenzenesulfonic acid with an organic compound containing olefinic unsaturation and carbon monoxide under an otherwise inert atmosphere at elevated temperature above about 125° 1 C. and elevated pressure above about 500 psig in the presence of a catalytic amount of a metal carbonyl compound and a promoter selected from pyridine, non-ortho-substituted alkylpyridine or mixtures thereof.

4,544,504

REACTIVE PHEROMONE MIMICS FOR INSECT MATING DISRUPTION

Glenn D. Prestwich, Head of the Harbor, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,516

Int. Cl.⁴ C07C *57/02*

U.S. Cl. 260—408 **8 Claims**

1. A compound of the formula R.C(F)=O wherein R is alkenyl, methylalkenyl, or alkadienyl having a straight-chain alk chain of 6 to 20 carbon atoms or gemdimethylcyclohexyl lower alkenyl having a lower alk chain of 1 to 4 carbon atoms, provided that where R.C(F)=O is undecenoyl fluoride the double bond is other than Δ10 and where R.C(F)=O is octadecenoyl fluoride the double bond is other than Δ9.

4,544,505

PREPARATION OF HALO-α-KETO-CARBOXYLIC ACIDS

Joachim W. Wolfram, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 21, 1983, Ser. No. 544,127

Int. Cl.⁴ C11C *1/00*

U.S. Cl. 260—413 **18 Claims**

1. A process for the preparation of halo-α-keto-carboxylic acids which comprises reacting a dihaloalkane in a liquid solvent medium with carbon monoxide at an elevated temperature of 30°–150° C. and an elevated pressure of 300–3000 psig in the presence of a catalytic amount of a metal carbonyl compound and an alkali metal inorganic base or an alkaline earth metal inorganic base and forming as the primary product a halo-α-keto-carboxylic acid.

4,544,506

QUATERNARY AMMONIUM COMPOUNDS AND METHOD FOR THEIR MANUFACTURE

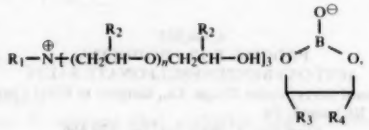
Kenneth B. White, Chicago; James M. Richmond, Naperville, and Keith D. Stanley, Downers Grove, all of Ill., assignors to Akzona Incorporated, Enka, N.C.

Filed Jan. 7, 1983, Ser. No. 456,239

Int. Cl.⁴ C07F *5/04*; C07C *107/02*

U.S. Cl. 260—462 R **32 Claims**

1. A quaternary ammonium compound having the formula:



wherein R_1 is a straight- or branched-chain alkyl or alkenyl radical having from 1 to 30 carbon atoms, inclusive, or a phenyl or benzyl radical; R_2 is H—, a C_1 to C_{10} straight- or branched-chain alkyl or alkenyl radical, a phenyl group, a benzyl group, or a halogenated alkyl group; R_3 and R_4 are different or the same and are selected from the group including H—, or a C_1 to C_{10} straight- or branched-chain alkyl or alkenyl radical, a phenyl group, or a benzyl group, and wherein n is an integer between 0 and 30 inclusive, said quaternary ammonium compound having a water content not greater than 1.2 percent.

4,544,507

PRODUCTION OF CARBONATE DIESTERS FROM OXALATE DIESTERS

Paul Foley, Hazlet, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,101

Int. Cl.⁴ C07C *68/00*

U.S. Cl. 260—463 **12 Claims**

1. A process for the production of a carbonate diester which consists of heating an oxalate diester at a temperature between about 50°–150° C. in a liquid medium containing an alcoholate catalyst to yield carbonate diester and carbon monoxide.

4,544,508

PROCESS FOR THE PREPARATION OF CERTAIN ENANTIOMERIC PAIRS OF α-CYANO-3-PHENOXY-4-FLUORO-BENZYL PERMETHRATE

Rainer Fuchs, Wuppertal, and Klaus Naumann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,759

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401483

Int. Cl.⁴ C07C *121/75*

U.S. Cl. 260—465 D **3 Claims**

1. A process for the preparation of the enantiomeric pairs (1R-3R-αS+1S-3S-αR) and (1R-3S-αS+1S-3R-αR) from a mixture of all 8 stereoisomers of the compound αR/S-cyano-3-phenoxy-4-fluorobenzyl 3R/S-(2,2-dichlorovinyl)-2,2-dimethyl-1R/S-cyclopropanecarboxylate, comprising dissolving the mixture in a secondary or tertiary alkylamine having 2–6 C atoms per alkyl radical, subjecting the solution to crystallization whereby the enantiomeric pairs (1R-3R-αS+1S-3S-αR) and (1R-3S-αS+1S-3R-αR) crystallize out from the solution, and separating the crystallized material.

4,544,509

ARYL COUPLING PROCESS

Robert I. Davidson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 15, 1983, Ser. No. 523,161

Int. Cl.⁴ C07C *121/66, 69/616*

U.S. Cl. 260—465 G **14 Claims**

1. A process which comprises coupling (A) an aminohalobenzene bearing a substituent corresponding to the formula —CHYR″ wherein R″ is hydrogen or an alkyl group of 1–6 carbons, Y is —CN or —$COOR_1$, and R_1 is an alkyl group of 1–6 carbons with (B) a benzene compound selected from benzene and hydroxy, halo, nitro, alkyl, alkoxy, alkoxycarbonyl, aryloxycarbonyl, phenyl, cyano, and cycloalkyl substituted benzenes wherein the substituents contain not more than about 10 carbons in the presence of water, an inorganic nitrite, and an alkanoic acid containing 5–7 carbons.

4,544,510

PROCESS FOR PREPARING CYCLOPROPANE CARBOXYLIC ACID ESTER DERIVATIVES

Johannes van Berkel, and Wilhelmus N. Ruyters, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

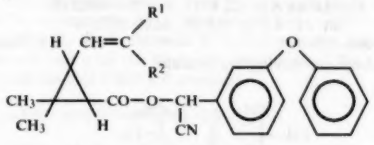
Filed Oct. 25, 1983, Ser. No. 545,302

Claims priority, application United Kingdom, Nov. 11, 1982, 8232283

Int. Cl.⁴ C07C *121/75*

U.S. Cl. 260—465 D **10 Claims**

1. A process for preparing a compound according to formula I containing substantially equimolar amounts of the 1R cis S- and the 1S cis R-isomers (the cis-2 enantiomer pair) and substantially free of the 1R cis R- and the 1S cis S-isomers (the cis-1 enantiomer pair),



(I)

wherein R^1 and R^2 are each independently selected from chlorine, bromine and methyl, which process comprises contacting the cis-1 enantiomer pair, alone or in the presence of the cis-2 enantiomer pair, with an organic amine base containing from 5 to 7 carbon atoms and being a secondary amine containing two branched alkyl groups or being a tertiary amine, and then separating off a solid compound containing the cis-2 enantiomer pair and substantially free of the cis-1 enantiomer pair, characterized in that the reaction mixture is in the form of a solid-liquid slurry.

4,544,511

PROCESS FOR PRODUCING ACETIC ANHYDRIDE

Tomiya Isshiki, Tokyo; Yasuhiko Kijima; Yuh Miyauchi, both of Chiba, and Takao Kondo, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 518,770, Aug. 2, 1983, abandoned, which is a continuation of Ser. No. 334,241, Dec. 24, 1981, abandoned. This application Feb. 22, 1985, Ser. No. 704,909

Claims priority, application Japan, Dec. 26, 1980, 55-188729; Feb. 4, 1981, 56-49692

Int. Cl.⁴ C07C *51/12*

U.S. Cl. 260—549 **18 Claims**

1. A process for producing acetic anhydride which comprises reacting methyl acetate or dimethyl ether with carbon monoxide at a temperature between 100° C. and 250° C. and at a partial carbon monoxide pressure between 3 kg/cm² and 150 kg/cm² in the presence of a catalyst comprising (a) nickel or a

nickel compound, (b) at least one halide selected from the group consisting of bromides, iodides and mixtures thereof and (c) at least one hetero cyclic compound containing at least one trivalent nitrogen atom, together with a co-catalyst, said co-catalyst comprising one or more compounds selected from the group consisting of lithium iodide, lithium acetate, stannous iodide, stannous acetate, stannic iodide and aluminum iodide.

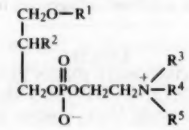
4,544,512

TRIDECYLOXY- OR TETRADECYLOXY-PROPANE DERIVATIVES

Motoo Hozumi, Omiya; Susumu Tsushima, Suita, and Yoshio Yoshioka, Kitakatsuragi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 311,876, Oct. 15, 1981, Pat. No. 4,426,525. This application Dec. 9, 1983, Ser. No. 559,634
Claims priority, application Japan, Oct. 22, 1980, 55-148485
Int. Cl.[4] C07F *9/11*
U.S. Cl. 260—925 **3 Claims**

1. A compound of the formula



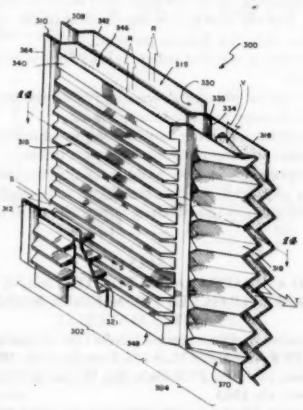
wherein
R^1 is tridecyl or tetradecyl,
R^2 is hydrogen or —OCH_3, and
R^3, R^4, and R^5 independently represent hydrogen or C_1–C_3 alkyl, with the proviso that when R^1 is tetradecyl, R^2 is OCH_3 or a pharmaceutically acceptable salt thereof.

4,544,513

COMBINATION DIRECT AND INDIRECT EVAPORATIVE MEDIA

Roy T. Otterbein, Phoenix, Ariz., assignor to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 485,200, Apr. 15, 1983, Pat. No. 4,461,733, which is a continuation-in-part of Ser. No. 479,127, Mar. 28, 1983,. This application Jul. 19, 1984, Ser. No. 632,246
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—153 **23 Claims**



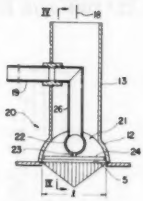
1. A plate for use in a combined indirect and direct evaporative cooling media, the plate comprising a generally sheet-like element having an indirect portion and a direct portion longitudinally adjacent the indirect portion, the indirect portion including a first indirect section, a second indirect section, and means for forming a hinge between the first and second indirect sections to permit the first indirect section to be folded about the hinge to place a surface of the first indirect section and a surface of the second indirect section in an opposed relation to form a channel therebetween.

4,544,514

UNIFORM DISTRIBUTOR APPARATUS FOR A GASEOUS AND LIQUID PHASE FLUID

Kaneo Yamada; Shigemi Okamoto, both of Akashi, and Kazuhiko Asada, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 16, 1983, Ser. No. 532,902
Claims priority, application Japan, Sep. 16, 1982, 57-161983
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—153 **5 Claims**



1. A heat exchanger assembly comprising:
(a) a heat exchanger core having a plurality of upwardly open, uniformly spaced descending flow passages therein;
(b) a gas-liquid separator;
(c) a header extending along the full length of said heat exchanger core, said header being downwardly open so as to be in fluid communication with said plurality of upwardly open, uniformly spaced descending flow passages in said heat exchanger core;
(d) at least one line for feeding gas from said gas-liquid separator to the interior of said header, from which the gas flows uniformly into said plurality of upwardly open, uniformly spaced descending flow passages in said heat exchanger core;
(e) a main pipe centrally located in said header and extending along the full length of said header;
(f) at least one line for feeding liquid from said gas-liquid separator to the interior of said main pipe;
(g) a plurality of short pipes extending downwardly from said main pipe in a line extending along the full length of said main pipe, said plurality of short pipes being in a predetermined spaced relationship relative to each other, each of said plurality of short pipes being entirely contained within said header and the interior of each of said plurality of short pipes being in fluid communication with the interior of said main pipe; and
(h) two branch pipes extending horizontally from the bottom of each of said plurality of short pipes, said two branch pipes extending in opposite directions perpendicularly to each of said plurality of short pipes, each of said branch pipes being entirely contained within said header and the interior of each of said branch pipes being in fluid communication with the interior of the corresponding one of said plurality of short pipes, each of said branch pipes having a plurality of vertically directed liquid spreading holes perforated in the bottom thereof along the full length thereof in a predetermined spaced relationship relative to each other, said plurality of vertically directed liquid spreading holes being closely spaced to said plurality of upwardly open, uniformly spaced descending flow passages in said heat exchanger core, whereby the liquid

flows uniformly and vertically downwardly from said plurality of vertically directed liquid spreading holes in said branch pipes into said plurality of upwardly open, uniformly spaced descending flow passages in said heat exchanger core.

4,544,515

METHOD FOR PRODUCING IN-SITU CONCRETED PILES WITH ENLARGED BASES

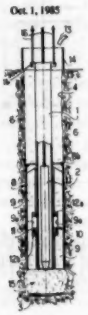
Ian H. Braatvedt, Liege, Belgium, assignor to Compagnie Internationale des Pieux Armes Frankignoul, Liege, Belgium

Filed Oct. 27, 1983, Ser. No. 545,948

Claims priority, application United Kingdom, Nov. 5, 1982, 8231681

Int. Cl.⁴ E04B *1/16*; E02D *5/44*

U.S. Cl. 264—32 **5 Claims**



1. A method for producing a concrete pile with an enlarged base, comprising the steps of:

providing a tube carrying at its lower end a shoe having a larger diameter than the tube for forming a gap between the tube and the ground, and an outer casing of a diameter substantially equal to the diameter of the shoe so that a space is left between the tube and the outer casing, said outer casing being slidably attached to the tube by a sliding joint that allows a predetermined length of relative sliding between the tube and the outer casing, said outer casing having a lower end attached to the shoe and an upper end open to permit free flow of concrete within said space,

driving the tube, with outer casing attached, into the ground to a depth greater than the length of the outer casing, thereby forming an opening in the ground and defining the gap between the tube and the ground,

filling the gap and the space with concrete as the tube with attached outer casing is driven into the ground,

when the shoe has reached a desired depth, expelling the shoe and from the lower end of the tube and the outer casing, along with some of the concrete, so as to form an enlarged base,

after said enlarged base is formed, raising the tube away from the shoe, thereby causing at first a sliding of said tube with respect to said outer casing which allows concrete from said space to enter the volume of space previously occupied by the lower end to the tube, and

thereafter removing both the tube and the outer casing from the ground and allowing concrete from the gap and space to fill the opening to form the pile.

4,544,516

COLLAGEN ORIENTATION

Kenneth E. Hughes, Gahanna; Timothy B. Hutson, Columbus, and David J. Fink, Marble Cliff, all of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 402,722, Jul. 28, 1982, abandoned. This application Jun. 30, 1983, Ser. No. 509,423

Int. Cl.⁴ B29D *7/02*; D01D *1/02*

U.S. Cl. 264—108 **16 Claims**

11. A method for producing collagen-based material having oriented collagen fibrils therein comprising

(a) introducing a solution of predominantly monomeric collagen into a cylindrical tube having a width of less than about two times the thickness, a height of greater than about four times the thickness, and a cross-sectional area of less than about 120 square millimeters,

(b) heating the outer surface of the cylindrical tube and, at a rate which results in convective flow within the collagen solution and a temperature therein which induces fibrillogenesis of the monomeric collagen to a collagen gel, and

(c) stabilizing the collagen gel by chemical cross-linking, and

(d) removing the stabilized collagen gel from the tube.

4,544,517

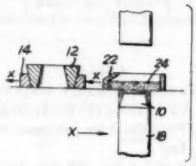
AUTOMATIC COMPOSITE PRESS TECHNIQUE FOR PRODUCING CUTTING INSERTS

John M. Ohno, Plymouth, Mich., assignor to General Electric Co., Detroit, Mich.

Filed Dec. 16, 1981, Ser. No. 331,376

Int. Cl.⁴ C04B *31/16*

U.S. Cl. 264—113 **13 Claims**



1. A process for providing an intermediate composite adapted to be sintered to produce a cutting insert, comprising the steps of:

(a) pre-pressing a material into a first pellet having a chamfer such that the size of the top portion of the first pellet is smaller than the bottom portion;

(b) positioning said first pellet on top of a first plunger within a mold;

(c) moving the plunger downwardly into the mold, the first pellet thereby moving into the mold;

(d) depositing a powder mix into the mold to thereby cover the sides and top portion of the first pellet;

(e) compressing, in said mold, said powder mix and said pellet to produce said intermediate composite; and

(f) removing said intermediate composite from said mold.

4,544,518

METHOD AND APPARATUS FOR THE MANUFACTURE OF SHAPED ARTICLES FROM FIBRE-REINFORCED PLASTICS MATERIAL

Kjell J. Lindskog, Floravägen 27, S-931 00 Skellefteå, Sweden

PCT No. PCT/SE83/00172, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03794, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 29, 1983, Ser. No. 574,100

Claims priority, application Sweden, Apr. 30, 1982, 8202744

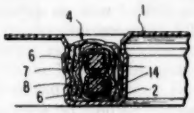
Int. Cl.⁴ B29H *9/02*

U.S. Cl. 264—257 **6 Claims**

1. In a method of manufacture of shaped articles from a

fibre-reinforced plastics material, in which dry spiky fibrous material is placed in a recess in a mould die consisting of one or more parts, said recess being closed by means of a mould cover which is moveable relative to the mould die, thereby to form a mould cavity, whereafter a solidifiable, liquid plastics composition is introduced into the mould cavity and there subjected to pressure of such magnitude that the mould cavity becomes substantially completely filled with said plastics composition, said mould cavity then being held closed until the plastics composition has at least partially solidified, the improvement wherein said method includes, in sequence, the steps of:

positioning said dry spiky reinforcing material in its intended orientation in a thin-walled replaceable lining consisting of a channel-shaped plate of stiff flexible plastics material capable of taking the shape of the mould with the shape



and size of the stiff, flexible channel-shaped plate corresponding to that of the mould cavity and filling said channel-shaped plate recess with said dry spiky reinforcing material such that said lining maintains the approximate shape of the finished article during filling of the reinforcing material within the channel recess with said lining functioning as a tray for said dry spiky reinforcing material during insertion into and removal from the mould die;

placing said lining with said reinforcing material oriented therein into said die recess;

removing said lining and the moulded article therein upon completion of the moulding operation; and

replacing the removed lining and moulded article with a similar lining having fresh dry spiky reinforcing material oriented therein after filling the channel-shaped recess of the similar lining with fresh dry spiky reinforcing material.

4,544,519

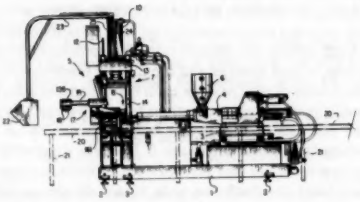
MACHINE AND METHOD FOR PRODUCING FOOTWEAR

Waldemar Schilke, Trenton, Canada, assignor to Bata Industries Limited, Batawa, Canada

Continuation of Ser. No. 421,430, Sep. 22, 1982, abandoned. This application May 22, 1984, Ser. No. 677,439

Int. Cl.⁴ B29C *5/00, 7/00;* **B29F** *1/00*

U.S. Cl. 264—328.1 **9 Claims**



1. A method of producing a footwear sole comprising the steps of:

(a) forming a mold cavity by moving a top mold assembly downwardly against a bottom mold assembly;

(b) injecting plastic material into said mold cavity to form the sole;

(c) opening the mold cavity by moving the top mold assembly upwardly away from the bottom mold assembly with the sole attached to said top mold assembly;

(d) swinging at least a portion of the top mold assembly downwardly around a horizontal axis to present the sole in a substantially vertical position for removal from the top mold assembly;

(e) gripping said sole to remove the sole from the top mold assembly;

(f) rotating said sole through approximately 180° around a vertical axis away from said top mold assembly;

(g) rotating said sole through approximately 90° around a horizontal axis to a discharge position; and

(h) releasing said sole, whereby the sole is discharged for further processing or packaging.

4,544,520

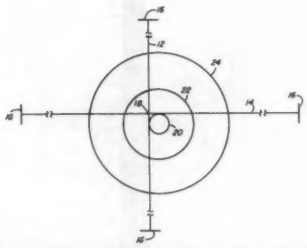
LASER TARGET FABRICATION, STRUCTURE AND METHOD FOR ITS FABRICATION

Eugene H. Farnum, and R. Jay Fries, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 25, 1978, Ser. No. 928,027

Int. Cl.⁴ G21B *1/00*

U.S. Cl. 376—152 **6 Claims**



1. A neutron producing laser target comprising:

a pair of crossed glass fibers disposed across an orifice on a target supporting plate;

a microsphere disposed in a quadrant formed by said crossed fibers glued at an equator tangentially to each of said fibers; and

at least one shell enclosing said microsphere comprising two hemispheres glued to said fibers with said microsphere disposed essentially at the center thereof.

4,544,521

ACTUATING DEVICE FOR TWO CLUSTERS OF CONTROL RODS MOVABLE VERTICALLY IN ONE AND THE SAME FUEL ARRAY OF THE CORE OF A NUCLEAR REACTOR

Jean-Paul Millot, Elancourt; Guy Desfontaines, Puteaux, and Michel Babin, Pantin, all of France, assignors to Framatome & Cie., Courbevoie, France

Filed Dec. 1, 1983, Ser. No. 556,867

Claims priority, application France, Dec. 8, 1982, 82 20543

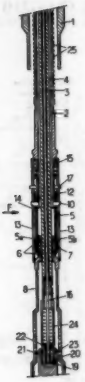
Int. Cl.⁴ G21C *7/02*

U.S. Cl. 376—209 **4 Claims**

1. An actuating device for two clusters of control rods movable vertically in one and the same fuel array in the core of a nuclear reactor comprising a vessel containing a pressurized fluid in which is immersed the reactor core consisting of arrays formed by vertically arranged bundles of fuel rods into which the clusters are inserted during the operation of the reactor, one of these clusters comprising neutron-absorbing rods effecting the running of the reactor by the vertical movements modifying the insertion of the absorbing rods, and the second cluster remaining fully inserted into the array during only a part of the operating cycle of the reactor, independently of the movements of the first cluster, each of the clusters consisting of an assembly of rods arranged mutually parallel and attached to a

fixing piece, the mechanism comprising two long vertical actuating rods (2, 3), the one associated with the first and the other with the second of the two clusters, movable within a fluid-tight enclosure (1) communicating with the internal volume of the vessel, a maintenance and controlled vertical movement mechanisms (27, 28, 29, 30, 34) in the fluid-tight enclosure of the actuating rod (2) of the first cluster and a detachable connecting device between each of the two clusters and the corresponding actuating rod (2, 3), wherein:

the actuating rod (2) of the first cluster, or first actuating rod, consists of a cylindrical sleeve carrying in its upper part hooking fingers (41) movable transversely to project into the internal space of the actuating rod (2) or on the contrary into the retracted position and an actuating device (45) of these fingers fitted slidingly in the axial direction on the top end of the actuating rod (2) between a closed position of the fingers (41) where the actuating device (45) is maintained in the top position relative to the actuating rod (2) by a spring (46) and an open position of



the fingers (41) where it is moved into the bottom position by virtue of a bearing surface (60) coming into abutment on a part (61) of the internal surface of the fluid-tight enclosure (1) at the end of the upward movement of the first actuating rod (2),

the actuating rod (3) of the second cluster, or second actuating rod, arranged coaxially and within the first actuating rod (2) throughout its length comprises a widened part (3_b) fitted with sealing segments (50) limiting the passage of the pressurized fluid in the annular space made between the two actuating rods (2, 3) and effecting the guidance of the second actuating rod (3) consisting of a piston in the first actuating rod (2), a hooking groove (53) for the fingers (41) carried by the first actuating rod (2) and a projecting part (55) serving as an abutment to stop the second actuating rod in the hooked position of the fingers at the end of the upward movement of the second rod (3) in the first (2),

lastly, the fluid-tight enclosure (1) comprises at its upper part a pressure relief valve (65) for its internal volume.

4,544,522

NUCLEAR FUEL ASSEMBLY SPACER

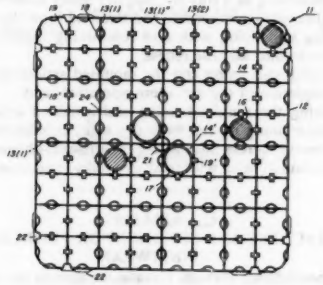
Michael V. Curulla, San Jose, Calif.; John F. Price, Wilmington, N.C.; Bruce Matzner, San Jose, Calif.; Kenneth W. Brayman, San Jose, Calif., and Frank D. Qurnell, San Jose, Calif., assignors to General Electric Company, San Jose, Caiif.

Filed Aug. 20, 1982, Ser. No. 409,946

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—441 **3 Claims**

1. A nuclear fuel assembly including a spacer for retaining fuel elements in lateral spaced position, said spacer comprising: a structure of divider members assembled together to form respective passages for said elements, each of said divider members having laterally extending upper and lower edges; double-sided springs of generally elliptical shape comprising a continuous, seamless loop of metal supported on said upper and lower edges of at least some of said divider members, said springs being slipped over said upper and lower edges of said divider members before said members are assembled together to form said passages, one side of each of said springs extending into one of said passages and the other side of each of said springs extending into an adjacent one of said passages for engagement with and resilient lateral support of the elongated elements extending through said passages, each said double-sided spring including upper and lower minor end portions for fitting said spring on said divider members, each side of each of said springs being formed with an outwardly bowed major middle portion for extension into one of said passages and including a substantially central apex portion for contact with the element extending through said one of said passages, each side of each of said springs being further formed with upper and lower intermediate portions between said middle and end portions, said intermediate portions being formed with bends arched in the same direction as said middle portion but extending outwardly to a lesser extent than said middle portion thereby to form stops for limiting extreme movement of said

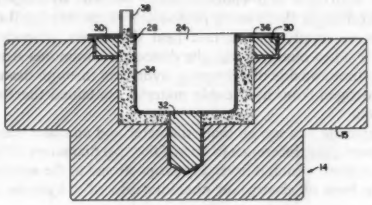


element in the direction of said spring; said springs being captured between upper and lower pairs of louvers formed in said some of said divider members near the upper and lower edges thereof after said springs are positioned thereon for retaining said springs in position on said divider members; at least some of said passages being bounded on four sides by divider members with springs mounted on divider members on two adjacent sides of said passage and the divider members on the two opposite sides of said passage each being formed with a pair of vertically spaced rigid projections formed by laterally oriented arched portions of the divider member whereby an element extending through said passage is laterally supported by two spring members and two pairs of rigid projections; a peripheral support band to which the ends of said divider members are secured, said support band forming the outer sides of the peripheral ones of said passages, said support band being formed with upper and lower rigid projections extending into said peripheral ones of said passages, said support band being formed with eight outwardly extending raised portions, two near each corner on each side, for providing spacing between said support band and a surrounding tubular flow channel, said support band being formed with eight inwardly curved upward projections, two near each corner on each side, to serve as lead-ins for installing a tubular coolant flow channel on said assembly.

4,544,523
CLADDING METHOD FOR PRODUCING A LINED ALLOY ARTICLE

William L. McCollough, Gibsonia, and Frank J. Wulczynski, Elizabeth, both of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1983, Ser. No. 542,877
Int. Cl.[4] B21D *53/00*
U.S. Cl. 419—8 3 Claims



1. A method for producing an alloy article having an internal passage or cavity clad with an alloy that is dissimilar in metallurgical composition to the alloy of the clad surface, said method comprising confining a lining of prealloyed powdered metal on a surface of said internal passage, said powdered metal being of an alloy different in metallurgical composition from the alloy of said surface, providing a solid lining element contiguous with at least a portion of said lining of powdered metal with said powdered metal lining being between said surface of said internal passage and said lining element, said powdered metal and solid lining element being confined within a space defined by a surface of said internal passage and a sleeve inserted within said passage in spaced-apart relation to said surface of said internal passage, said lining element being of an alloy having a metallurgical composition identical to that of said powdered metal, heating said powdered metal and solid lining element, evacuating said space to subatmospheric pressure and hot-isostatic pressing said powdered metal to densify and bond said powdered metal and said solid lining element to said internal passage of said alloy article to clad said internal passage with an alloy that is dissimilar in metallurgical composition to the alloy of said clad surface.

4,544,524
PROCESS FOR MANUFACTURING SOLID CATHODES

Tiberiu Mizrah, Schaffhausen; Matthias Hoffmann, Diessenhofen; Peter Käser, and Klemens Heilig, both of Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 572,798, Jan. 23, 1984, Pat. No. 4,492,670. This application Oct. 9, 1984, Ser. No. 658,521
Claims priority, application Switzerland, Feb. 10, 1983, 740/83
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.[4] C25C *7/06;* C25B *11/04*
U.S. Cl. 419—9 14 Claims

1. A process for manufacturing solid cathodes for the fused salt electrolytic production of aluminum wherein the cathode material is wettable by precipitated aluminum comprising:

mixing a powdered titanium and a boron containing material with a powdered carbon material wherein the ratio of the sum of the powdered carbon material is super stoichiometric in an amount between 5 to 20 wt. % in excess of the required stoichiometric amount with respect to said powdered titanium and a boron containing material to form titanium diboride so as to form a mixture;

heating said mixture to a first temperature of about between 1600° to 2200° C.;

holding said heated mixture at said first temperature for about 5 to 45 minutes to form a reaction product characterized by pores and channels;

heating said reaction product to a second temperature of about between 2250° to 2600° C.;

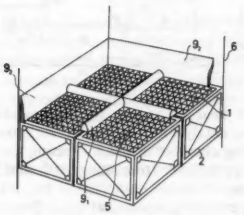
holding said heated reaction product at said second temperature for about 10 to 60 minutes to form a molten titanium diboride-carbon eutectic; and

forming a wettable cathode from said molten titanium diboride-carbon eutectic.

4,544,525
SOLID GAS CONTACT REACTOR

Mitsuyasu Honda; Masao Hino, and Toru Seto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 263,568, May 14, 1981, abandoned. This application Jan. 14, 1983, Ser. No. 458,015
Claims priority, application Japan, May 19, 1980, 55-67571[U]
Int. Cl.[4] B01D *50/00*
U.S. Cl. 422—171 3 Claims



1. In a solid-gas reactor for dirty exhaust gases generated by combustion of coal or heavy oil, comprising a plurality of walls forming an upright reactor and defining a flow path for exhaust gas therethrough in the downward direction with said reactor laterally defining the transverse area of said flow path, at least one stage of catalyst packages located within and extending across said flow path through the upright reactor, a support base extending across said reactor for supporting said packages, said at least one stage of catalyst packages comprising a plurality of individual packages of catalysts supported on and extending upwardly from said support base, each of said individual packages comprising a plurality of honeycomb catalysts and an upwardly extending frame structure laterally enclosing said plurality of honeycomb catalysts, wherein the combination of said individual packages of catalysts and said frame structure fill the transverse area of said flow path, with said frame structure for said packages comprising at least one first side which is adjacent to the first sides of other frame structures and thereby defining a joint between adjacent frame structures and at least one second side which is directly adjacent to and extends along a portion of said walls, wherein the improvement comprises said support base extending across the full transverse area of the flow path within said reactor, a first dust-proof plate means extending downwardly from said support base at a position spaced inwardly from said walls into contact with said walls at a location spaced below said support base, wherein said first dust-proof plate means comprises a first part extending vertically downwardly from said support base and a second part extending from the lower end of said first part outwardly to said wall with said second part disposed at an angle with respect to said support base which is not less than the rest angle of the dust in the exhaust gas, a second dust-dproof plate means located on the upper sides of said frame structures, said second dust-proof plate means comprising a plurality of first panels forming an inverted V-shaped structure extending upwardly from said frame structure at a position bridging the joint between adjacent frame structures, and second panels comprising a first part extending vertically

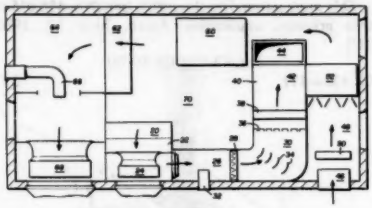
upwardly from a position adjacent said second side of said frame structure and a second part extending upwardly from the upper end of said first part outwardly to said walls with said second part disposed at an angle with respect to said walls which is approximately the same angle as said angle of said first dust-proof means with respect to said support base.

4,544,526

OVEN HEAT EXCHANGER

Bruce J. Billings, Northville, Mich., assignor to Durr Industries, Inc., Plymouth, Mich.

Filed May 3, 1982, Ser. No. 374,571
Int. Cl.[4] F01H *3/10*
U.S. Cl. 422—173 **3 Claims**



1. An oven heat exchanger for recirculating oven gases having a heater catalyst means for oxidizing oven effluents and having a heating chamber means for raising the temperature of oven effluent gases prior to reacting with said heater catalyst, wherein the improvement comprises:

the heating chamber means having a flame heater located therein, said heating chamber means including means for receiving effluent oven gases from said oven and said heating chamber means terminating in a damper means for directing the oven gases to an elbow duct, said elbow duct communicating with said heating chamber for receiving the effluent oven gases through said damper means for recirculation, said damper means controlling the volume of oven gases received in said elbow duct, said elbow duct having a central arcuate bend portion, a plurality of spaced arcuate vanes located in said elbow duct such that an imaginary vertical plane normally intersecting the vertical projections of the opposed ends of said elbow duct corresponding to the bend portion in the elbow duct normally intersects the vertical projections of said arcuate vanes, said vanes further located in said elbow duct such that oven effluents entering said elbow duct are normally directed to the exit of said elbow duct, said elbow duct terminating in a straight linear portion have a perforated baffle means located therein, the perforations in said baffle means communicating with said elbow and said heater catalyst being porous and generally planar and located generally perpendicular to the flow exiting said perforated baffle, said vanes in combination with said perforated baffle creating generally laminar flow of said oven effluent gases evenly distributed across said catalyst, improving the efficiency of said catalyst and the distribution of said oven gases on said catalyst.

4,544,527

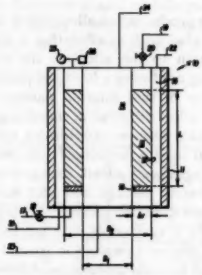
HYDROGEN FROM AMMONIA

Robert W. Meyerhoff, Zionsville, Ind., assignor to Ergenics, Inc., Wyckoff, N.J.

Continuation-in-part of Ser. No. 436,521, Oct. 25, 1982,. This application Feb. 11, 1985, Ser. No. 700,308
Int. Cl.[4] B01J *8/02*; C01B *3/56*
U.S. Cl. 422—188 **10 Claims**

1. A reactor system for the delivery of between 28 to 2800 cu m/day of hydrogen on-site using hydridable materials to separate hydrogen from a dissociated ammonia stream comprising at least one flow-through reactor, said reactor comprising an annularly-shaped hydride bed, means defining an inner heat-exchange shell and means defining an outer heat exchange shell, wherein said hydride bed is located coaxially to and between said inner shell and said outer shell; means to provide uniform gas flow with low pressure drop through the hydride bed; means for introducing the dissociated ammonia feed stream to and means for permitting the flow of waste gas or hydrogen from the hydride bed, the hydride bed comprising a hydridable material which exothermally and selectively absorbs hydrogen and endothermally desorbs hydrogen, said heat exchanger shells being provided with circulating fluid and means to supply and extract heat therefrom, whereby said reactor when charged with the dissociated ammonia stream, is at any time capable of delivering hydrogen through desorption of hydrogen from hydridable material contained therein; and wherein

said hydride bed has an inner diameter and an outer diameter, wherein the difference in size of the two diameters differs by an amount which is inversely proportional to the square root of a heat of absorption characteristic of a hydride in the



hydride bed, and wherein the performance of said reactor system is predicted semi-quantitively by the equation:

$$F^2=(D_1+D_2)^2L^2\pi^2K2W\Delta T/\Delta Ht$$

where

F = Hydrogen flow rate, moles/sec.

D_1 = Diameter of inner wall of the hydride shell, cm

D_2 = Diameter of outer wall of the hydride shell, cm

L = Length of hydride bed, cm

π = Constant = 3.14

K = Thermal conductivity of hydride bed, cal·sec^{-1}·cm^{-1}·K^{-1}

ρ = Density of hydride bed, g/cc

ΔT = Temperature difference between reactor wall and mid-point of the hydride bed, °Kelvin

ΔH = Heat of adsorption of hydride, cal/mole

t = Charging or discharge time, sec. and D_2 is related to D_1 by the relationship

$$D_2=D_1+8[Kt\Delta T/\Delta H\rho W]^{\frac{1}{2}}$$

where W = Grams of hydrogen per gram of hydride.

4,544,528

APPARATUS FOR GROWING TUBULAR CRYSTALLINE BODIES

Richard W. Stormont, Warwick, R.I., and Lawrence Eriss, Arlington, Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Division of Ser. No. 289,410, Aug. 3, 1982, Pat. No. 4,440,728. This application Dec. 6, 1982, Ser. No. 446,860
Int. Cl.[4] C30B *15/34*
U.S. Cl. 422—246 **13 Claims**

1. Apparatus for use in growing thin-walled hollow tubular

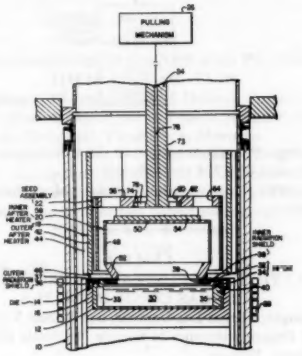
crystalline bodies from the melt employing a hollow elongate tubular seed, said apparatus comprising in combination:

a crucible suitable for containing a melt;

a capillary die at least partially disposed within said crucible, said capillary die having an end face in the form of a closed plane geometric figure and capillary means for feeding melt from said crucible to said end face;

means for (a) holding an elongate hollow tubular seed of predetermined cross-sectional configuration in contact with a film of melt on said end face, and (b) moving said seed vertically away from said end face;

an inner radiation shield disposed interior to said capillary



die end face and supported so as to be clear of and confront any melt in said crucible, said inner radiation shield having a central aperture; and

a hollow tubular inner after heater dimensioned to be wholly contained within said tubular seed when said seed is in contact with a film of melt on said end face, said inner after heater being supported on said inner radiation shield and having an interior in communication with said crucible through said aperture in said inner radiation shield; and

a hollow tubular outer after heater surrounding and spaced from said inner after heater, said outer after heater being dimensioned so as to surround said seed when said seed is in contact with said film of melt.

4,544,529

BOTTLE STERILIZER

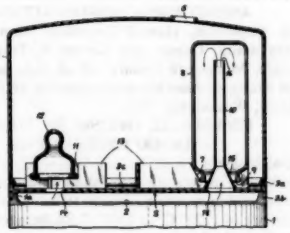
Horst Hoeck, Am Adamshäuschen 8, 5100 Aachen, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,749

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149754

Int. Cl.[4] A61L *2/00*

U.S. Cl. 422—303 **4 Claims**



1. A bottle sterilizer attachment for an egg cooker having a base provided with an upwardly open water receiving pan, an electric heater below said pan for heating and boiling water thereon, and means for cutting off said electric heater, said attachment comprising:

a synthetic resin plate formed unitarily with a downwardly extending ridge engageable over a rim of an upwardly open water receiving pan, an upwardly extending ridge along an outer periphery of said plate, a multiplicity of flat plate-like upstanding ribs with cut out portions oriented such that three angularly equispaced ribs at each of a multiplicity of locations so as to define recesses therein providing for a plurality of seats including bottle seats dimensioned to receive infant-feeding bottles and nipple seats dimensioned to receive nipples for said bottles, said plate being provided with respective openings within said seats for permitting steam formed in a pan to rise through said openings and contact bottles and nipples located on said seats;

respective upwardly extending tubes aligned with the openings of said bottle seats having upwardly converging frustoconical bases covering the openings of said bottle seats whereby steam is delivered to the upper end of inverted bottles placed on said bottle seats, said bottle seats holding said bottles out of contact with said bases; and

a hood of a height greater than that of said bottles removably formed over said plate and engaging said upwardly extending ridge, said hood having a vent, said ribs defining passages beneath said seats communicating with the space within said hood surrounding the bottles and nipples.

4,544,530

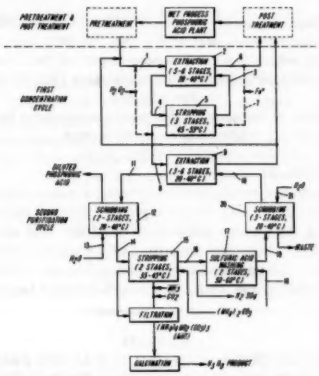
SEPARATION PROCESS FOR THE RECOVERY OF URANIUM FROM WET-PROCESS PHOSPHORIC ACID

Ying-Ming Tsai, Taipei; Hsiao-Ming Chen, Taiwan, and Ting Gann, Taipei, all of Taiwan, assignors to Institute of Nuclear Energy Research, Taiwan, Taiwan

Continuation of Ser. No. 195,871, Oct. 10, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 516,667

Int. Cl.[4] C01G *43/00*

U.S. Cl. 423—10 **5 Claims**



1. A separation process for the recovery of uranium having a purity of at least 99 percent from wet-process phosphoric acid comprising the steps of:

(1) Extracting uranyl ion present in the acid oxidized by hydrogen peroxide with a synergistic extractant comprised of about 0.5–0.7M di(2-ethylhexyl)phosphoric acid and about 0.1–0.14M dibutyl butyl phosphonate in kerosene said di(2-ethylehexyl) phosphoric acid and dibutyl butyl phosphonate being present in a molar ratio of 5:1, respectively;

(2) Concentrating the uranium by the reductive stripping of

the uranium-loaded organic phase with a phosphoric acid strip solution containing a suitable amount of ferrous ion to provide a concentrated uranium solution;

(3) Re-oxidizing and extracting said concentrated uranium solution with said synergistic extractant comprised of about 0.3–0.5M di(2-ethylhexyl)phosphoric acid and about 0.06–0.1M dibutyl butyl phosphonate in kerosene;

(4) Scrubbing the uranium-loaded organic phase with water and stripping said organic solvent with an ammonium carbonate solution to precipitate the uranium as ammonium uranyl tricarbonate;

(5) Scrubbing the stripped organic phase with sulfuric acid solution and water and recycling said organic phase to the second cycle extraction step.

4,544,531

URANIUM HEXAFLUORIDE PURIFICATION PROCESS

Jacques Aubert; Louis Bethuel, and Maurice Carlès, all of Pierrelatte, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 10, 1983, Ser. No. 465,537

Claims priority, application France, Feb. 24, 1982, 82 03021

Int. Cl.[4] C01G *43/06*

U.S. Cl. 423—19 **11 Claims**

1. A process for the purification of a uranium hexafluoride composition containing traces of neptunium fluoride and/or plutonium fluoride comprising:

(a) contacting said uranium hexafluoride composition to a metal fluoride chosen from the group including lead fluoride PbF_2, uranium fluorides of UF_{4+x}, in which x has a value between 0 and 1, and chromium trifluoride, at a contacting temperature such that the plutonium and/or neptunium fluorides are reduced, and thereafter recovering the purified uranium hexafluoride composition.

4,544,532

SOLVENT EXTRACTION

Gary A. Kordosky; R. Brantley Sudderth; J. Michael Sierakoski, all of Tucson, Ariz., and Kenneth D. MacKay, Plymouth, Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 592,828, Mar. 23, 1984, , which is a continuation-in-part of Ser. No. 500,041, Jun. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 340,991, Jan. 25, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 660,592

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] C01G *3/00*

U.S. Cl. 423—24 **7 Claims**

1. A reagent composition comprising a mixture of a substantially pure 2-hydroxy-5-nonyl phenyl methyl ketone oxime containing no kinetic additive or modifier and an aldoxime selected from the group consisting of 2-hydroxy-5-heptyl benzaldoxime, 2-hydroxy-5-octyl benzaldoxime, 2-hydroxy-5-nonyl benzaldoxime, and 2-hydroxy-5-dodecyl benzaldoxime.

4,544,533

RECOVERING VANADIUM VALUES FROM AMMONIUM BICARBONATE SOLUTION USING HEAT, SULFURIC ACID, AND AMMONIUM SULFATE

Paul J. Marcantonio, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 26, 1984, Ser. No. 674,816

Int. Cl.[4] C01G *31/00*

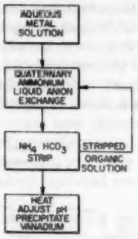
U.S. Cl. 423—67 **7 Claims**

1. A method of recovering vanadium values from an aqueous ammonium bicarbonate solvent extraction strip solution comprising:

(a) heating the aqueous ammonium bicarbonate strip solution containing vanadium values to a temperature of from 70° C. to 100° C. in order to decompose the ammonium bicarbonate to NH_3 and CO_2;

(b) distilling NH_3 and CO_2 from the aqueous solution;

(c) adding sulfuric acid to the strip solution in order to bring the pH of the strip solution in the range of from 6.5 to 8.5;



(d) adding ammonium sulfate to the solution to a total concentration of 0.2M to 10M; and

(e) separating the vanadium metal values from the strip solution.

4,544,534

CATALYTIC DESULFURIZATION PROCESS OF AN ACID GAS CONTAINING H_2S

Thierry Dupin, Garges Les Gonesse, and Robert Voirin, Orthez, both of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

PCT No. PCT/FR82/00208, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02068, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 10, 1982, Ser. No. 537,385

Claims priority, application France, Dec. 17, 1981, 81 23611

Int. Cl.[4] B01D *53/36;* C01B *17/04*

U.S. Cl. 423—230 **39 Claims**

1. A process of catalytic desulfurization of an acid reaction gas free of SO_2 comprising H_2S and optionally a total amount of at most 3% by volume of CS_2 and/or COS, so that the total content, called the potential content of H_2S, of free H_2S and of H_2S theoretically available from any CS_2 and COS that may be present, is at most equal to 5% by volume, with the recovery of sulfur which comprises contacting said acid reaction gas and a gas free of SO_2 and containing free oxygen in a molar ratio of oxygen to potential H_2S between 0.35 and 0.6, in the presence of a catalyst in a catalytic zone at a reaction temperature between 100° and 600° C. with a contact time between the gaseous reaction medium and the catalyst between 1 and 6 seconds, said catalyst comprising titanium dioxide and a sulfate of an alkaline-earth metal selected from the group consisting of calcium, strontium, barium and magnesium.

4,544,535

METHOD OR PREPARING NONLAMINATING ANISOTROPIC BORON NITRIDE

Louis E. Branovich, Howell Township, Monmouth County; Bernard Smith, Ocean, and Gerard L. Freeman, Freehold Township, Monmouth County, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1985, Ser. No. 715,215

Int. Cl.[4] C01B *21/06*

U.S. Cl. 423—290 **8 Claims**

1. Method of preparing non laminating anisotropic boron nitride comprising reacting a boron trihalide with ammonia at a temperature of 1100° C. to 1600° C. in the presence of a small amount of a volatile oxygen containing compound, the small amount of volatile oxygen containing compounds being sufficient to prevent lamination yet small enough to prevent the finalized product from losing its anisotropy.

7. Method of preparing non laminating anisotropic boron nitride comprising reacting boron trichloride with ammonia according to the reaction:

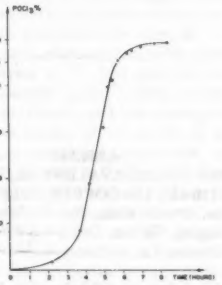
$$BCl_3 + 4NH_3 \rightleftharpoons BN + 3NH_4Cl$$

at a temperature of 1100° C. to 1600° C. in the presence of a small amount of water sufficient to prevent lamination yet small enough to prevent the finalized product from losing its anisotropy.

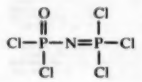
4,544,536
POLYCHLOROPHOSPHAZENES AND PROCESS FOR THEIR PREPARATION

Roger De Jaeger, Chereng; Moncef Helioui, Tunis, and Emile Puskaric, Pont A Marcq, all of France, assignors to Institut Mondial du Phosphate, Casablanca, Morocco

Continuation-in-part of Ser. No. 187,184, Sep. 15, 1980, Pat. No. 4,377,558. This application Mar. 21, 1983, Ser. No. 477,397
Claims priority, application France, Sep. 27, 1979, 79 24037
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.[4] C01B *25/10*
U.S. Cl. 423—300 **9 Claims**

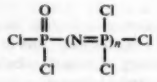


1. Linear polychlorophosphazenes resulting from heating P-trichloro-N-dichlorophosphoryl-monophosphazene of formula II



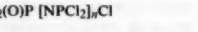
II

with release of a controlled amount of $POCl_3$ to recover a practically pure linear polychlorophosphazene of the general formula:



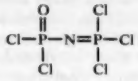
wherein n is equal to or greater than 4.

2. Process for the preparation of the novel linear polychlorophosphazenes of formula I



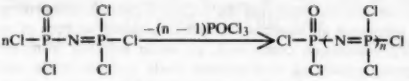
I

said process comprising the polycondensation by heating of P-trichloro-N-dichlorophosphoryl-monophosphazene of the following formula II:



II

in accordance with the following equation III:



III

with a controlled release of $POCl_3$, to obtain quantitatively a practically pure polychlorophosphazene of formula I, of controlled degree of condensation, wherein $n \geqq 4$, said polycondensation by heating being carried out at a temperature equal to or higher than 180° C.

4,544,537
METHOD FOR PURIFYING CYCLIC DICHLOROPHOSPHAZENE TRIMER OF CATALYTIC IMPURITIES

Daniel F. Graves, Clinton, and Dennis L. Snyder, Mineral City, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 17, 1984, Ser. No. 682,131
Int. Cl.[4] C01B *25/10*
U.S. Cl. 423—300 **7 Claims**

1. A process for purifying cyclic dichlorophosphazene trimer which is substantially pure except for catalytic impurities, said process comprising the steps of

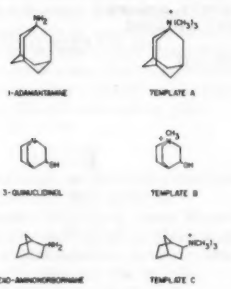
(a) contacting the trimer in the liquid phase with P_2O_5 for about 10 to about 30 minutes at a temperature ranging from about 120° C. to about 170° C. at atmospheric pressure,

(b) subjecting the product resulting from step (a) to a single further purification step by sublimation, melt filtration or distillation to recover trimer which is substantially free of catalytic impurities and which will not polymerize in the absence of added catalyst at 300° C. or below.

4,544,538
ZEOLITE SSZ-13 AND ITS METHOD OF PREPARATION

Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 397,007, Jul. 9, 1982, abandoned. This application Aug. 3, 1983, Ser. No. 519,954
Int. Cl.[4] C01B *33/20*
U.S. Cl. 423—326 **10 Claims**



2. A zeolite having a composition, as synthesized and in the anhydrous state, in terms of mole ratios of oxides as follows:

(0.5 to 1.0)R_2O:(0 to 0.50)M_2O—W_2O_3: (greater than 5) YO_2 wherein M is an alkali metal cation, W is selected from the group consisting of aluminum, gallium and mixtures thereof, Y is selected from the group consisting of silicon, germanium and mixtures thereof, R is a quaternary lower alkylammonium cation compound selected from the group consisting of N-alkyl-3-quinuclidinol, N,N,N-tri-alkyl-1-adamantammonium, and N,N,N-trialkyl-exoaminonorbornane, or mixtures thereof, and having the X-ray diffraction pattern of Table 1.

8. A method for preparing the zeolite of claim 2, comprising:

(a) preparing an aqueous mixture containing sources of an organonitrogen compound, an oxide selected from the group consisting of aluminum oxide, gallium oxide, and mixtures thereof, and an oxide selected from silicon oxide, germanium oxide, and mixtures thereof the aqueous mixture having the following composition in terms of mole ratio of oxides:

YO_2/W_2O_3=5–350

M_2O/W_2O_3=0.5 to 20

R_2O/W_2O_3=0.5–40

wherein R is a quaternary lower alkylammonium cation compound selected from the group consisting of N-alkyl-3-quinuclidinol, N,N,N-trialkyl-1-adamantammonium, and N,N,N-trialkyl-2-exoaminonorbornane or mixtures thereof, Y is silicon, germanium, or mixtures thereof, W is aluminum, gallium, or mixtures thereof;

(b) maintaining the mixture at a temperature of at least 100° C. until the crystals of said zeolite form; and

(c) recovering said crystals.

4,544,539

ZEOLITE L WITH CYLINDRICAL MORPHOLOGY

Theodorus M. Wortel, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 11, 1983, Ser. No. 493,688

Claims priority, application United Kingdom, May 14, 1982, 8214147

Int. Cl.⁴ C01B *33/28;* **B01J** *29/28*

U.S. Cl. 423—328 **27 Claims**

1. A zeolite having an X-ray diffraction pattern obtained from CuK_α radiation with significant d values set out in Table A hereinbefore and comprising highly crystalline crystallites having at 50% of its crystallites in the form of distinct circular cylinders with an aspect ratio of at least 0.5 and with a mean diameter of at least 0.5 micron.

4,544,540

DIAMOND SINGLE CRYSTALS, A PROCESS OF MANUFACTURING AND TOOLS FOR USING SAME

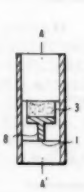
Kazuo Tsuji, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 22, 1983, Ser. No. 506,935

Claims priority, application Japan, Jun. 25, 1982, 57-110398; Aug. 13, 1982, 57-141505

Int. Cl.⁴ C01B *31/06*

U.S. Cl. 423—446 **11 Claims**



1. In a process for manufacturing diamond single crystals, comprising the steps of:

providing a diamond synthesis reaction system comprised of a reaction chamber housing having positioned therein a carbon source and a solvent metal arranged in contact with the said carbon source:

providing a seed crystal in the reaction chamber;

providing temperatures and pressures in the reaction chamber which permit diamond to be maintained thermodynamically stable in the reaction chamber housing;

heating the reaction chamber to provide a temperature gradient in such a way that a portion of the solvent metal in contact with the carbon surface is higher in temperature than a portion of the solvent metal in contact with the seed crystal so as to migrate the carbon from the higher temperature portion to the lower temperature portion using the solvent metal as a medium; and

allowing the carbon to precipitate and grow as a diamond on the seed crystal due to the difference in solubility caused by the temperature gradient in the reaction chamber housing,

the crystal growth being maintained until the crystal growth in the reaction chamber housing in at least one direction perpendicular to the direction of the temperature gradient is suppressed at the end of the solvent metal to thereby form a rough surface which diffusibly reflects light on the crystal due to suppressed crystal growth, wherein said temperature provided is from about 1300° to 1600° C. and said pressure provided is from about 50 to 60 Kb, and the crystal growth is maintained from about 10 to 100 hours.

4,544,541

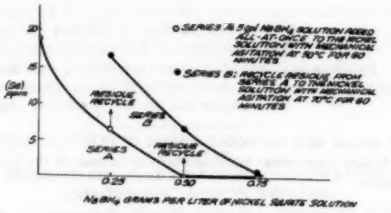
REMOVAL OF HEXAVALENT SELENIUM FROM NICKEL, COBALT OR COPPER SULFATE SOLUTION

Eddie C. Chou, Arvada, Colo.; Ben W. Wiegers, Wilmer, Ala.; Dale K. Huggins, Golden, Colo., and Edward I. Wiewiorowski, New Orleans, La., assignors to AMAX Inc., Greenwich, Conn.

Filed Jun. 14, 1984, Ser. No. 620,670

Int. Cl.⁴ C01B *19/00*

U.S. Cl. 423—508 **16 Claims**


SERIES A: 5 gal NaBH4 SOLUTION ADDED ALL AT ONCE TO THE NICKEL SOLUTION WITH MECHANICAL AGITATION AT 70°C FOR 90 MINUTES
SERIES B: RECYCLE PRESSURE FROM SERIES A TO THE NICKEL SOLUTION WITH MECHANICAL AGITATION AT 70°C FOR 90 MINUTES
(Se) ppm
20
15
10
5
PREVIOUS RECYCLE
SERIES B
SERIES A
PREVIOUS RECYCLE
0.25
0.50
0.75
NaBH4 GRAMS PER LITER OF NICKEL SULFATE SOLUTION

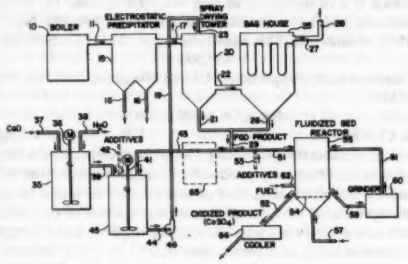
1. The process for removing hexavalent selenium from an acidic sulfate process solution containing the same and at least one metal ion from the group consisting of nickel, cobalt and copper at ambient pressure and at a temperature not exceeding the boiling point of said solution which comprises treating said solution with an effective amount of an agent from the group consisting of metal hydrides, metal borohydrides, ammonia borane, and their derivatives and finely divided metal from the group consisting of nickel, cobalt and copper resulting from in situ precjpitation of said metal in an acid sulfate solution thereof upon treatment with said compound, to reduce said hexavalent selenium to a form separable from said solution by solid-liquid separation.

4,544,542

METHOD FOR OXIDATION OF FLUE GAS DESULFURIZATION ABSORBENT AND THE PRODUCT PRODUCED THEREBY

Peter A. Angevine, Ridgefield, Conn.; Sune Bengtsson, Bad Nauheim, Fed. Rep. of Germany, and George P. Koudijs, Lijnden, Netherlands, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 16, 1984, Ser. No. 600,710
Int. Cl.[4] C01B *17/05;* C01F *11/46;* C22B *1/243*
U.S. Cl. 423—555 19 Claims



1. A method for treatment of a particulate fine-grained calcium sulfite material which is the spent absorbent of a flue gas desulfurization process, comprising the steps of:

(a) Introducing the particulate calcium sulfite material into a fluidized bed reactor as the bed material therefor, the calcium sulfite material having a small amount of low-melting constituents therein, said low-melting constituents being present in an amount of 1% to 3%, by weight;

(b) Passing on oxygen-containing gas upwardly through the calcium sulfite bed material to fluidize the bed and oxidize said calcium sulfite material to form calcium sulfate;

(c) Concurrently with step (b), maintaining the bed temperature in the range from 700° C. to 1000° C. to assure that said low-melting constituents are in the liquid phase to agglomerate said calcium sulfate to form pellets; and

(d) Cooling the oxidized pellets, comprising primarily calcium sulfate, to ambient temperature.

4,544,543

PURIFICATION OF ALKYLATED ANTHRAQUINONES

Nathan D. Lee, Lambertville, and Dalbir S. Sethi, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 25, 1983, Ser. No. 488,576
Int. Cl.[4] C01B *15/023;* C07C *50/18*
U.S. Cl. 423—588 24 Claims

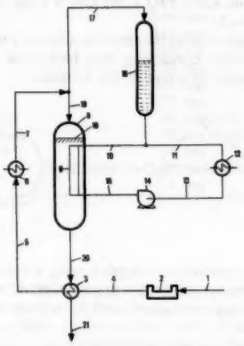
1. The process for purifying a nonaqueous solution of an impure alkylated anthraquinone containing an unalkylated anthraquinone as an impurity comprising reducing said solution sufficiently to convert at least part of the unalkylated anthraquinone to a reduced form and contacting said solution in the absence of oxygen with an alkaline, aqueous solution whereby reduced unalkylated anthraquinone is extracted from the nonaqueous solution.

4,544,544

PLATE REACTORS FOR CHEMICAL SYNTHESES UNDER HIGH PRESSURE IN GASEOUS PHASE AND WITH HETEROGENEOUS CATALYSIS

Quang Dang Vu, Neuilly sur Seine; Claude Pradel, Rueil-Malmaison; Jean-Paul Euzen, Dardilly, and Jean-Francois Le Page, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 25, 1983, Ser. No. 555,260
Claims priority, application France, Nov. 26, 1982, 82 20026
Int. Cl.[4] C01B *3/12;* C01C *1/04*
U.S. Cl. 423—659 16 Claims



1. A process for effecting chemical syntheses from reaction gases in gaseous phase and under pressure in a reaction zone (**8**, see FIGS. **4** and **4A**) defined by an enclosure of substantially cylindrical shape and of substantially circular transverse cross-section, the process being carried out in the presence of a solid catalyst, and said process being characterized in that the reaction zone is divided into a plurality of enclosures (**9**) containing the catalyst therein, said enclosures being shaped as elongate parallelipipeds and located adjacent to each other, the transverse cross-sections of these enclosures being substantially included in a circle coaxial to the circle defined by the circular section of the reaction zone, the adjacent walls (**1**, such as **1***a*, **1***b*, **1***c*) of these enclosures or walls common to adjacent enclosures being tight to the gases flowing through the reaction zone, the side walls (**2**, such as **2***a*, **2***b*, **2***c*, etc . . .) of said enclosures (**9**) being permeable to the gases, with the gases introduced in the reaction zone thus flowing progressively through each of the enclosures substantially perpendicularly to the axis of the reaction zone, and these gases penetrating into each enclosure (**9**) through a permeable wall and issuing therefrom through a permeable wall opposite to the wall wherethrough the gases are admitted, the process being further characterized in that said walls (**1**, such as **1***a*, **1***b*, **1***c*, etc . . .) are hollow plates whose internal spaces communicate with each other, and comprising flowing a fluid heat carrier through said walls or plates under a pressure substantially equal to the pressure to which are subjected the reaction gases.

4,544,545

LIPOSOMES CONTAINING MODIFIED CHOLESTEROL FOR ORGAN TARGETING

Patrick J. Ryan, Worcester; Michael A. Davis, Westwood, and Donald L. Melchior, Framingham, all of Mass., assignors to Trustees University of Massachusetts, Amherst, Mass.

Filed Jun. 20, 1983, Ser. No. 505,696
Int. Cl.[4] A61K *49/00, 43/00, 39/00*
U.S. Cl. 424—1.1 12 Claims

1. In a liposome formed by the incapsulation of an active agent by at least one lipid containing bilayer, the improvement comprising a ligand modified cholesterol compound in the

lipid of said bilayer, said ligand being positioned at the 3 carbon position of said cholesterol, said ligand modified cholesterol compound rendering the liposome more specific for accumulation at a pre-selected organ in vivo.

4,544,546

FLUORESCENT NUCLEIC ACID STAINS

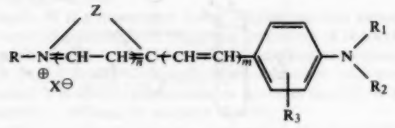
Chao-Huei J. Wang, Gurnee, and Michael E. Jolley, Round Lake, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 278,812, Jun. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 142,321, Apr. 21, 1980, abandoned. This application Jul. 5, 1983, Ser. No. 510,506

Int. Cl.[4] C12Q *1/68*; G01N *1/00, 31/00*

U.S. Cl. 424—7.1 **18 Claims**

1. A method of detecting nucleic acids in a biological sample which comprises contacting said biological sample with an effective amount of a dye of the formula:



wherein n represents an integer having a value of 0 or 1;

m represents an integer having a value of 1 or 2;

R represents a member selected from the group consisting of lower alkyl, lower hydroxyalkyl, dialkylaminoalkyl, pyrrolidinoalkyl and morpholinoalkyl;

R_1 and R_2 independently represent a member selected from the group consisting of hydrogen, lower alkyl and lower haloalkyl;

R_3 represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and amino;

Z represents nonmetallic atoms necessary to complete a heterocyclic nucleus selected from the group consisting of a benzothiazole nucleus, indolenine nucleus, naphthothiazole nucleus, benzoselenazole nucleus, benzoxazole nucleus, quinoline nucleus, and pyridine nucleus any of which may be substituted with lower alkyl, halo, nitro, amino and dialkylamino; and

X represents an anion; thereby producing a complex between the dye and the nucleic acids; irradiating the complex with light of excitation wavelength thereby causing the complex to emit fluorescence; and measuring the emitted fluorescence.

4,544,547

ECTOPARASITICIDE-CONTAINING POLYURETHANES

Miklos von Bittera, Leverkusen; Hubert Dorn, Wuppertal; Dietmar Schäpel, Cologne; Wilhelm Stendal, Wuppertal; Herbert Voege, Leverkusen; Manfred Federman, Wuppertal, and Ulrich von Gizyoki, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 308,716, Oct. 5, 1981, abandoned. This application Mar. 14, 1983, Ser. No. 475,008

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3039882

Int. Cl.[4] A01N *25/34, 25/00*

U.S. Cl. 424—14 **17 Claims**

1. An ectoparasiticide-containing polyurethane, comprising a hydrophobic polyurethane which cannot be swollen in water and which contains, relative to the polyurethane, 2 to 30% by weight of an ectoparasiticide, said ectoparasiticide selected from the group consisting of an insecticidally active carbamate having a vapor pressure of between about 10^{-4} and 10^{-6} mm Hg measured at 20° C., and an insecticidally active synthetic pyrethroid, and combinations thereof and, relative to the polyurethane, 8 to 25% by weight of a spreading agent, said spreading agent selected from the group consisting of silicone oils, fatty acid esters, fatty alcohols, fatty acids and combinations thereof.

4,544,548

METHOD FOR THE CONTROL OF COCCIDIOSIS IN POULTRY

Paul J. Davis, Felmersham, and James F. Reynolds, Souldrop, both of England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 228,479, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 49,070, Jun. 18, 1979, abandoned, which is a continuation of Ser. No. 959,984, Nov. 13, 1978, abandoned. This application Apr. 27, 1983, Ser. No. 487,593

Claims priority, application United Kingdom, Nov. 14, 1977, 7747335

Int. Cl.[4] A61K *37/00*

U.S. Cl. 424—93 **9 Claims**

1. In a method for promoting the growth of poultry wherein a sub-clinical immunity-producing coccidiosis infection is induced by deliberate exposure of said poultry to a low level of viable sporulated oocysts of at least one species of coccidia to which said poultry are susceptible, the improvement comprising administrating said viable sporulated oocysts in a feedstuff containing about 6 to about 12% by weight of moisture and in a concentration sufficient only to induce sub-clinical infection of said poultry, thus causing a continuous, progressive self-innoculation controlled by the daily quantity of feedstuff eaten by each bird.

4. In a method as claimed in claim **1**, the further improvement that while they are being reared on the oocyst-containing diet said poultry are administered at a curative level an anticoccidial drug effective against said species of coccidia, said anti-coccidial drug being one of which the major activity is directed against parasitic stages of the coccidium appearing on the fourth day of infection or later.

4,544,549

DERIVATIVES OF CLAVULANIC ACID, THEIR PREPARATION AND THEIR USE

John B. Harbridge, Coulsdon, England, assignor to Beecham Group p.l.c., England

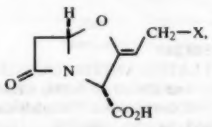
Division of Ser. No. 325,979, Nov. 30, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,149

Claims priority, application United Kingdom, Dec. 9, 1980, 8039447; Jun. 12, 1981, 8118110

Int. Cl.[4] A61K *35/00*

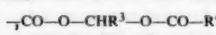
U.S. Cl. 424—114 **20 Claims**

11. A method of treating bscterial infections in humans and animals which comprises administering to a human or animal in need thereof a synergistically effective amount of a compound of the formula (II):

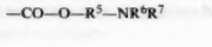


(II)

a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof wherein X is tetrazolyl attached via a nitrogen atom, said tetrazolyl moiety being unsubstituted or substituted by a non-toxic carboxyl salt, an in-vivo hydrolyzable carboxyl ester of the formula (b), (C), (d) or (e):



(b)



(c)

$$CO—OA^1 \quad (d)$$

or

$$CO—O—CHA^2A^3 \quad (e)$$

wherein R^3 is hydrogen, methyl or phenyl; R^4 is alkyl of 1 to 6 carbon atoms, phenyl, phenylalkyl of 1 to 3 carbon atoms in the alkyl moiety, alkoxy of 1 to 6 carbon atoms, phenoxy or phenylalkoxy of 1 to 3 carbon atoms in the alkyl moiety; or R^3 and R^4 are joined to form a 1,2-diphenylene or 3,4-dimethoxy-1,2-diphenylene moiety; R^5 is methylene or ethylene; R^6 and R^7 are each methyl or ethyl; A^1 is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by alkoxy of 1 to 7 carbon atoms; A^2 is alkenyl of 2 to 7 carbon atoms unsubstituted or substituted by phenyl; phenyl unsubstituted or substituted by fluoro, chloro, bromo, nitro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and A^3 is hydrogen; alkyl of 1 to 4 carbon atoms or phenyl unsubstituted or substituted by fluoro, chloro, bromo, nitro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 6 carbon atoms, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or aryl unsubstituted or substituted by hydroxy, halo, aryl, carboxy, alkanoyl of 1 to 6 carbon atoms, alkanoyloxy of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkoxycarbonyl of 1 to 6 carbon atoms, arylalkoxy of 1 to 6 carbon atoms in the alkyl moiety, arylcarbonyl, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, arylthio, amino, azido, mono-alkylamino of 1 to 6 carbon atoms in the alkyl moiety or di-alkylamino of 1 to 6 carbon atoms in each alkyl moiety; azido; isocyani; cyano; nitro; bromo; chloro; or is a group of the sub-formula (a):

$$—(CO)_n—NR^1R^2 \quad (a)$$

wherein n is zero or one; R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, alkanoyl of 1 to 6 carbon atoms or arylcarbonyl unsubstituted or substituted by one or more hydroxy, halo, carboxy, alkanoyl of 1 to 6 carbon atoms, alkanoyloxy of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, aralkoxy of 1 to 10 carbon atoms in the alkoxy moiety, arylcarbonyl, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, arylthio, amino, alkylamino of 1 to 6 carbon atoms in the alkyl moiety or dialkylamino of 1 to 6 carbon atoms in each alkyl moiety; and R^2 is hydrogen, alkyl of 1 to 6 carbon atoms, or alkanoyl of 1 to 6 carbon atoms, or R^1 or R^2 is methyl substituted by carboxy, alkanoyl of 1 to 6 carbon atoms, alkanoyloxy of 1 to 6 carbon atoms, alkoxycarbonyl of 1 to 6 carbon atoms or arylcarbonyl; or R^2 is not methyl, the R^2 moiety is substituted by hydroxy, halo, carboxy, alkanoyl of 1 to 6 carbon atoms, alkanoyloxy of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, arylalkoxy of 1 to 6 carbon atoms in the alkoxy moiety, arylcarbonyl, alkylthio of 1 to 6 carbon atoms, arylthio, amino, alkylamino of 1 to 6 carbon atoms or di-alkylamino of 1 to 6 carbon atoms; or R^1 and R^2 are joined to form with the nitrogen atom to which they are attached, a 4-, 5- or 6-membered ring wherein the nitrogen atom is the only heteroatom and wherein aryl as used herein is phenyl, pyrrolyl, furyl, thienyl, indolyl, benzofuryl, or thionaphthyl, and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,544,550

METHOD FOR THE TREATMENT OF DIABETES

Almanzor Y. Rodolfo, 806-F Paz Building Taft Ave., Manila, Philippines

Filed Oct. 5, 1982, Ser. No. 432,867

Int. Cl.[4] A61K *33/00, 33/34, 33/32, 33/26*

U.S. Cl. 424—127 **3 Claims**

1. A method of reducing the blood sugar in the treatment of diabetes which comprises orally administering to a patient in need of such treatment an effective amount of a composition comprising the following ingredients in amounts proportional to the following amounts:

Vitamin A	85 i.u.
Vitamin D	68 i.u.
Vitamin E	1.7 i.u.
Vitamin C	27.5 mg
Vitamin B_1	0.425 mg
Vitamin B_2	0.425 mg
Vitamin B_6	0.085 mg
Vitamin B_{12}	0.34 mg
Vitamin K	1.66 mg to 8 mg
Niacinamide	3.4 mg
Calcium Pantothenate	0.85 mg
Iron	1.5 mg
Calcium	5.95 mg
Manganese	0.17 mg
Potassium	0.85 mg
Magnesium	1.02 mg
Copper	0.17 mg
Iodine	0.0255 mg
Animal Protein	83 mg to 95 mg
Plant Protein	10 mg to 80 mg
Chlorophyllin	1.5 mg
Thyroglobulin	21.59 mg to 60 mg
Sugar	114 mg

4,544,551

ANTIPEPTIC ULCER COMPOSITION

Du Hong-Yue, No. 10 La. 48, Teh-Cheng St., Hsin-Chu Hsien, Taiwan

Continuation of Ser. No. 854,549, Nov. 25, 1977, abandoned. This application Feb. 22, 1982, Ser. No. 350,865

Claims priority, application United Kingdom, Nov. 30, 1976, 49885/76

Int. Cl.[4] A61K *33/26*

U.S. Cl. 424—147 **9 Claims**

1. An orally administered antipeptic ulcer composition comprising a therapeutically effective amount of ferrous sulfate, clove and licorice.

4,544,552

PROCESS FOR THE PREPARATION OF CELL AND TISSUE REGENERATING SUBSTANCES

Wolfgang Fraefel, Grolley, and Roland Tschannen, Basel, both of Switzerland, assignors to Solco Basel AG, Basel, Switzerland

Filed May 26, 1983, Ser. No. 498,468

Claims priority, application Switzerland, May 28, 1982, 3328/82

Int. Cl.[4] A61K *31/70, 35/14;* **C12N** *5/00*

U.S. Cl. 514—23 **8 Claims**

1. A process for the preparation of cell- and tissue-regenerating substances of the glycolipid series from blood or organ homogenates from mammals, comprising subjecting the blood or organ homogenate to autolysis and dialysis against an alcoholic-aqueous medium, the autolysis and dialysis being carried out simultaneously and continuously, in a countercurrent process.

4,544,553

PESTICIDAL PHOSPHOROAMIDO (DI) THIOATES

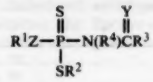
Joel R. Smolanoff, Chalfont, Pa.; J. Michael Fitzpatrick, Sao Paulo, Brazil, and Janet Ollinger, Chalfont, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 276,780, Jun. 24, 1981, abandoned. This application Jun. 22, 1982, Ser. No. 391,072

Int. Cl.[4] A01N *57/26;* **C07F** *9/36*

U.S. Cl. 514—92 **17 Claims**

1. A compound having the formula:



wherein:

R^1 is unsubstituted or substituted (C_1–C_4) alkyl wherein the substituent can be one (C_1–C_4)alkoxy or from one to four of the same or different bromo, chloro or fluoro groups; (C_3–C_6) alkenyl; (C_3–C_6) alkynyl; unsubstituted or substituted phenyl wherein the substituent can be from one to three of the same or different alkyl, haloalkyl, halo, alkoxy, alkylthio, cyano, nitro, amino, or mono- or di-alkylamino, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms; or unsubstituted or substituted phenyl (C_1–C_3) alkyl wherein the substituent on the phenyl ring can be from one to three of the same or different alkyl, haloalkyl containing one to three of the same or different halo, alkoxy, alkylthio, cyano, nitro, amino, or mono- and di-alkylamino groups, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms;

R^2 is unsubstituted straight or branched chain (C_3–C_5) alkyl or substituted (C_2–C_5) alkyl wherein the substituent can be from one to three of the same or different alkyl, halo, alkoxy, alkylthio, cyano, nitro, amino, or mono- or di-alkylamino, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms, (C_3–C_6) alkenyl; (C_3–C_6) alkynyl; (C_3–C_6) cycloaliphatic or heterocycloaliphatic; unsubstituted or substituted phenyl wherein the substituent can be from one to three of the same or different alkyl, haloalkyl containing one to three of the same or different halo, alkoxy, alkylthio, cyano, nitro, amino, or mono- or di-alkylamino, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms; or unsubstituted or substituted phenyl (C_1–C_3) alkyl wherein the substituent on the phenyl ring can be from one to three of the same or different alkyl, haloalkyl containing one to three of the same or different halo, alkoxy, alkylthio, cyano, nitro, amino, or mono- and di-alkylamino groups, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms;

R^3 is hydrogen, methyl, trifluoromethyl, carbo(C_1–C_4)alkoxy, or thiocarbo(C_1–C_4)alkoxy;

R^4 is unsubstituted or substituted (C_1–C_7) alkyl wherein the substituent can be one to three of the same or different carbo(C_1–C_4)alkoxy, halo, alkoxy, benzoyl, alkylthio, cyano, nitro, unsubstituted or substituted phenoxy or phenylthio wherein the substituent can be from one to three of the same or different alkyl, alkoxy, halo, cyano, nitro, or alkylthio, or amino or mono- or di-alkylamino, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms; unsubstituted or substituted (C_3–C_6) alkenyl wherein the substituent can be from one to three of the same or different phenyl, alkyl, carbo(C_1–C_4)alkoxy, bromo, chloro or fluoro groups; (C_3–C_6) alkynyl; unsubstituted or substituted phenyl wherein the substituent can be from one to five of the same or different halo or from one to three of the same or different alkyl, haloalkyl containing one to three of the same or different halo, alkoxy, alkylthio, cyano, nitro, amino, or mono- or di-alkylamino, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms; or unsubstituted or substituted phenyl, or naphthyl, (C_1–C_3) alkyl wherein the substituent is on the phenyl ring and wherein the substituent can be from one to five of the same or different halo or from one to three of the same or different alkyl, haloalkyl containing one to three of the same or different halo, alkoxy, alkylthio, benzoyloxy, methylenedioxy, cyano, nitro, amino, or mono- or di-alkylamino groups, wherein the alkyl moiety is straight or branched chain and contains from one to three carbon atoms;

Y and Z are independently O or S.

4,544,554

TRIPHASIC ORAL CONTRACEPTIVE

Samuel A. Pasquale, Basking Ridge, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 536,135, Sep. 26, 1983,. This application May 4, 1984, Ser. No. 607,038

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514–170 **10 Claims**

1. A method of contraception which comprises administering for 21 successive days to a female of childbearing age a combination of an estrogen and a progestogen in a low but contraceptively effective daily dosage corresponding in estrogenic activity to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.065–0.75 mg of norethindrone for 5–8 days; for the next 7–11 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.250–1.0 mg of norethindrone; and for the next 3–7 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity 0.35–2.0 mg of norethindrone; followed by 6–8 days without estrogen and progestogen administration, provided that the estrogen daily dosage is the same for each period.

4,544,555

3,20-DIKETO, 6-METHYL, 17-ALPHA-HYDROXY 19-NORPREGNA 4,6-DIENE, ITS ESTERS AND THE USES THEREOF

Jean M. Gastaud, 3 avenue Prince Pierre, Monte Carlo, Monaco

Continuation of Ser. No. 144,064, Apr. 28, 1980, abandoned, and a continuation-in-part of Ser. No. 577,009, May 13, 1975,. This application Sep. 27, 1982, Ser. No. 424,350

Int. Cl.[4] C07J *5/00, 7/00*

U.S. Cl. 260—397.4 **18 Claims**

1. The 3,20-diketo, 6-methyl,17-alpha hydroxy 19-nor-pregna-4,6-diene.

4. A method for the intramuscular treatment of luteal deficiency, or hyperestrogenic or hyperandrogenic conditions, which comprises administering the compound of claim 1 by injection from injectable ampuls containing 50 to 150 mg/ml of the compound in a pharmaceutically acceptable solvent.

4,544,556

XANTHINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND THEIR THERAPEUTIC USE

Mauro Fedi, Sesto Fiorentino, and Graziano Bonacchi, Pistoia, both of Italy, assignors to Malesci S.p.A. Istituto Farmacologico, Florence, Italy

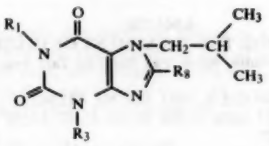
Filed Aug. 4, 1983, Ser. No. 520,272

Claims priority, application Italy, Aug. 10, 1982, 48970 A/82

Int. Cl.[4] C07D *473/08;* **A61K** *31/52*

U.S. Cl. 514—263 **12 Claims**

1. A compound of the formula



(I)

wherein

R_1=H; CH_3

$R_3 = C_nH_{2n+1}$
$R_8 = H; CH_3$
n is 1 to 5.

4,544,557

6-(1-HYDROXYETHYL)-2-(2-AMINOETHYLTHIO)-3-TETRAZOLY-1-CARBADETHIAPEN-2-EM

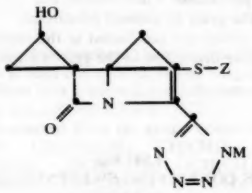
W. Alexander Andrus, Fanwood; Burton G. Christensen, Cliffside Park, and James V. Heck, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 403,190, Jul. 29, 1982, abandoned. This application Oct. 5, 1983, Ser. No. 539,192

Int. Cl.[4] C07D *487/04;* **A61K** *31/40*

U.S. Cl. 514—210 **4 Claims**

1. The compound



wherein Z is C_1–C_3 alkylamino, C_1–C_3 alkylguanidino, C_1–C_3 alkylamidino, or N-pyrrolidinyl, M is H or a pharmaceutically acceptable cation selected from sodium and potassium.

4,544,558

PROCESS FOR PREPARING CARBOHYDRATES FROM VEGETAL JUICE

Armando P. Pellegrini, Rua General Dionisio Cerqueira, 307, 30.000 Belo Horizonte, Minas Gerais, Brazil

Continuation-in-part of Ser. No. 375,277 filed as PCT BR81/00005, Aug. 13, 1981, published as WO82/00662, Mar. 4, 1982 § 102(e) date Apr. 26, 1982, abandoned. This application May 23, 1983, Ser. No. 497,056

Claims priority, application Brazil, Aug. 27, 1980, PI 8005458

Int. Cl.[4] C13K *1/06, 1/10;* **C12P** *19/24, 19/20, 19/14, 7/06, 7/08, 7/14*

U.S. Cl. 426—48 **5 Claims**

1. A process for producing carbohydrates from vegetal juice comprising

(a) extracting said vegetal juice from raw vegetal material,

(b) filtering said vegetal juice to remove material suspended therein,

(c) subjecting said vegetal juice resulting from step (b) to an enzymatic reaction consisting of the following four stages in sequence:

(i) admixing said vegetal juice in the first stage with 3.2.1.4-β-1,4-glucan glucanhydrolase in an amount of 1.5U and 3.2.1.15-poly-α-1,4-galacturonic glucan hydrolase in an amount of 0.9U;

(ii) admixing said vegetal juice in the second stage with 3.2.1.20-α-D-glucoside glucohydrolase in an amount of 0.3U;

(iii) admixing said vegetal juice in the third stage with 3.2.1.21-β-D-glucoside glucohydrolase in an amount of 0.3U, 5.3.1.4-L-arabinose-ketol-isomerase in an amount of 0.15U and 5.3.1.5-D-xylose-ketol-isomerase in an amount of 0.15U; and

(iv) admixing said vegetal juice in the fourth stage with 3.2.1.1-α-1,4-glucan-4-glucanhydrolase in an amount of 0.12U and 3.2.1.3-α-1,4-glucan glucanhydrolase in an amount of 0.22U, the unit U being the amount of each of the said enzymes required to hydrolyze one mole of starch in 10 minutes,

(d) filtering the vegetal juice resulting from the enzymatic reaction of step (c) to produce a carbohydrate containing filtrate,

(e) evaporating under reduced pressure said filtrate to remove water therefrom, and

(f) crystallizing the product resulting from step (e) thereby producing said carbohydrates in solid form.

4,544,559

NUCLEOTIDE ENRICHED HUMANIZED MILK AND PROCESS FOR ITS PREPARATION

Angel Gil, and Luis Valverde, both of Granada, Spain, assignors to Union Industrial y Agroganadera, S.A. (UNIASA), Granada, Spain

Filed Nov. 15, 1982, Ser. No. 441,758

Claims priority, application Spain, Nov. 16, 1981, 507187

Int. Cl.[4] A23C *9/00;* **A23L** *1/30;* **B65B** *55/14*

U.S. Cl. 426—72 **7 Claims**

1. Nucleotide enriched humanized milk in powder form which comprises: cow's milk; demineralized whey; vegetable oils; lactose; dipotassium phosphate; tripotassium citrate; sodium ascorbate; vitamins; minerals; and all of the following nucleotides in the precise ratios cited: AMP (adenosine-monophosphate) 1.32 mg/100 g, CMP (cytidine-monophosphate) 1.12 mg/100 g, GMP (guanosine-monophosphate) 1.49 mg/100 g, UMP (uridine-monophosphate) 3.42 mg/100 g and IMP (inosine-monophosphate) 0.45 mg/100 g.

4,544,560

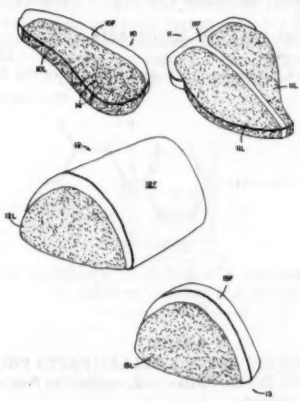
STRUCTURED MEAT PRODUCT

Peter M. O'Connell, Box 38, 13967 Marquesas Way, Marina Del Rey, Calif. 90291, assignor to Peter M. O'Connell, Philadelphia, Pa.

Division of Ser. No. 931,501, Aug. 7, 1978,. This application Oct. 19, 1979, Ser. No. 86,278

Int. Cl.[4] A23L *1/31*

U.S. Cl. 426—104 **4 Claims**



1. A fabricated meat product which is a facsimile of a natural primal or portion cut of meat, characterized by:

a lean portion of definite shape and comprising a plurality of lean meat chunks bonded together by a protein exudate from said chunks, and

first and second fat portions each of definite shape and each comprising a paste-like ground fat mass, said fat portions being separate from but bonded to said lean portion by protein exudate from said chunks, said first fat portion forming a rim about part of said lean portion, said second fat portion being interior of and surrounded on at least two sides by parts of said lean portion, said lean and fat portions each corresponding in shape, dimension and

configuration to said natural cut, said interior second fat portion simulating natural fat marbling.

4,544,561

METHOD OF MANUFACTURING FOOD RESEMBLING SCALLOP AND FOOD RESEMBLING SCALLOP OBTAINED BY THE SAME METHOD

Chogo Komukai, Aomori, Japan, assignor to Hachinohe Kanzume Co., Ltd., Aomori, Japan

Filed Apr. 16, 1984, Ser. No. 600,739

Claims priority, application Japan, Apr. 15, 1983, 58-66436; Apr. 15, 1983, 58-56393[U]

Int. Cl.⁴ A23L *1/325*

U.S. Cl. 426—104 **7 Claims**

1. A method of manufacturing a food product resembling scallop meat comprising the steps of:

preparing thermally molded filaments of a material comprising ground fish meat;

thermally molding a plurality of these filaments without use of any binder into a cylindrical integrated material having a plurality of peripheral annular recesses spaced apart at a predetermined interval in the longitudinal direction, said filaments being oriented along the longitudinal axis; and

cutting said cylindrical material along the center of each said peripheral annular recess.

4,544,562

6-ARYL-4,5-DIHYDRO-3(2H)-PYRIDAZINONES, AND THEIR USE AS ANTI-HYPERTENSIVE AND ANTI-THROMBOCYTE AGENTS

Phillip A. Rossy; Marco Thyes, both of Ludwigshafen; Albrecht Franke, Wachenheim; Horst Koenig, Ludwigshafen; Josef Gries, Wachenheim; Hans D. Lehmann, Hirschberg, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

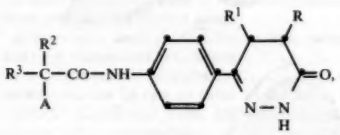
Filed Mar. 11, 1983, Ser. No. 474,431

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209159

Int. Cl.⁴ C07D *237/06;* **A61K** *31/50*

U.S. Cl. 514—247 **11 Claims**

1. A 6-aryl-4,5-dihydro-3(2H)-pyridazinone of the formula



(I)

where R is hydrogen, R^1 is methyl, R^2 is hydrogen or methyl, R^3 is hydrogen, and A is methoxy or nitrile.

4,544,563

PROCESS OF PREPARING A GELLED PASTA PRODUCT

Jürg Lechthaler, Zurich, Switzerland, assignor to Nestec S. A., Vevey, Switzerland

Filed Aug. 25, 1983, Ser. No. 526,429

Claims priority, application Switzerland, Sep. 23, 1982, 5619/82

Int. Cl.⁴ A23L *1/04;* **A21D** *8/00*

U.S. Cl. 426—276 **12 Claims**

1. A process for the production of pasta based on starchy materials, which comprises mixing a flour or semolina of a starchy material with soft water and an ionic gelling agent to obtain a dough containing from 35 to 55% of water, gelatinising the dough by heating and kneading under pressure, cooling the dough to a temperature below 100° C., extruding it in the form of pasta, bringing the pasta into contact with water containing a cation which forms a gel with the ionic gelling agent, and drying the pasta.

4,544,564

PROCESS FOR STABILIZING WHOLE CEREAL GRAINS

George N. Bookwalter, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 24, 1984, Ser. No. 635,945

Int. Cl.⁴ A23L *1/172*

U.S. Cl. 426—462 **12 Claims**

1. A method for improving the storage stability of a whole cereal grain without altering its functional properties comprising the following steps:

(a) heating said whole grain at a moisture content of about 13–17% to a temperature in the range of about 90°–110° C.;

(b) holding the grain at said temperature until substantially all of the peroxidase is inactivated; and

(c) cooling the grain to ambient conditions;

wherein steps (a)–(c) are conducted in the absence of forces sufficient to cause disruption of the grain's microstructures.

4,544,565

FOODSTUFFS CONTAINING SWEETNESS INHIBITING AGENTS

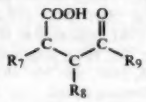
Ronald E. Barnett, Suffern, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,600

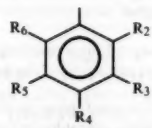
Int. Cl.⁴ A23L *2/26, 1/236;* **A61K** *9/68, 7/16*

U.S. Cl. 426—538 **14 Claims**

1. A foodstuff composition comprising a foodstuff, a sweetener and a sweetness inhibiting amount of a sweetness inhibiting compound having the general formula:



wherein R_7 is selected from the group consisting of hydrogen and C_1–C_3 alkyl, R_8 is selected from the group consisting of hydrogen and C_1–C_3 alkyl and wherein R_9 is the group



wherein R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_2 hydroxyalkyl, hydroxy and COOH; and the non-toxic salts thereof.

4,544,566

3-HYDROXY-4-ALKYLOXYPHENYL HETEROCYCLIC CARBONATES

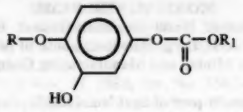
Ronald E. Barnett, Suffern; Jed A. Riemer, Scarsdale, and Paul R. Zanno, Nanuet, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,459

Int. Cl.⁴ A23L *1/236;* **C07C** *69/96*

U.S. Cl. 426—548 **10 Claims**

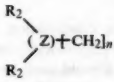
5. A foodstuff containing a compound of the formula:



wherein:

R is methyl or ethyl;

R_1 is of the formula:



wherein Z is a five-membered heterocyclic ring in which the hetero is at least one of S, O, N and NR_2; wherein n is an integer from 0 to 1 when Z is a fully-saturated heterocyclic ring and, otherwise n = 1;

each R_2 is selected from the group consisting of H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $CH(CH_3)_2$, OH, OCH_3, $CH(OH)CH_3$, OCH_2CH_3, $OCH(CH_3)_2$, CH_2OH, CH_2CH_2OH, $CH_2CHOHCH_3$, CH_2OCH_3, CHO, $COCH_3$, $COCH_2CH_3$, CH_2COCH_3, and $COOCH_3$ with the proviso that R_1 contain no more than 12 carbon atoms; and

salts thereof, said compound being present in an amount effective to perceive sweetness in said foostuff.

4,544,567

SIMULTANEOUS COFFEE HYDROLYSIS AND OIL EXTRACTION

Martin Gottesman, Paramus, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jan. 18, 1984, Ser. No. 571,896

Int. Cl.[4] A23F *5/24*

U.S. Cl. 426—594 **9 Claims**

1. A method of simultaneously hydrolyzing coffee grounds and extracting the coffee oil therefrom which comprises:

(a) slurrying the spent coffee grounds in water so that the grounds are from 10% to 40% by weight of the slurry;

(b) adding an acid to the slurry to adjust the pH to between 0.7 and 3.0 ;

(c) combining the pH-adjusted slurry with a water-immiscible, oil solvent at a volume ratio of from 1:1 to 3:1 oil solvent to slurry;

(d) dispersing the oil solvent in the pH-adjusted slurry as finely divided droplets;

(e) heating the dispersion of (d) in a reactor to a temperature between 180° C. and 240° C. in from 5 seconds to 60 seconds so as to hydrolyze the coffee grounds and extract the oil therefrom; and

(f) separating the then coffee oil-containing oil solvent from the aqueous hydrolysate and separating the grounds from the hydrolysate.

4,544,568

CHEESE FLAVORING PRODUCT

Sven Heyland, Warth, Switzerland; Gaston Fournet, St-Lo, France, and Hans Bösch, Wiesendangen, Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Filed Dec. 17, 1984, Ser. No. 682,320

Claims priority, application Switzerland, Dec. 29, 1983, 6967/83

Int. Cl.[4] A23L *1/227*

U.S. Cl. 426—650 **10 Claims**

1. A flavouring product which imparts the flavour of cheese, characterized in that it contains from 5 to 40 parts by weight of vegetable protein hydrolyzate, from 3 to 20 parts by weight of leucine and from 15 to 30 parts by weight of aromatic fat containing aromatic substances from the crust of hard or semi-hard cheese.

4,544,569

STEAROYL LACTYLATE SALT COMPOSITION HAVING IMPROVED PHYSICAL PROPERTIES AND METHOD OF PRODUCTION

Curtis J. Forsythe, Raytown, Mo., assignor to Top-Scor Products, Inc., Kansas City, Kans.

Continuation of Ser. No. 888,224, Mar. 20, 1978, Pat. No. 4,264,639, and Ser. No. 232,735, Feb. 9, 1981, Pat. No. 4,371,561. This application Sep. 29, 1982, Ser. No. 428,080

The portion of the term of this patent subsequent to Apr. 27, 1998, has been disclaimed.

Int. Cl.[4] A21D *2/16*

U.S. Cl. 426—653 **30 Claims**

1. A powdered composition of reduced hygroscopicity and increased melting point produced by the process comprising the steps of mixing together:

(a) a stearoyl lactylate salt selected from the group consisting of sodium stearoyl lactylate, calcium stearoyl lactylate, potassium stearoyl lactylate, and mixture thereof and being within a range of about 98% to about 70% (by weight) of said composition; and

(b) an hydrogenated stearin within a range of about 2% to about 30% (by weight) of said composition; said stearin having an iodine value of less than about 7 and all fatty acid radicals on said stearin are in a range of about 50% to 100% (by weight of fatty acid) of at least C_{18} fatty acid;

(c) mixing said stearin and said salt while said salt is in a molten state;

(d) cooling said salt after mixing; and thereafter

(e) powdering said salt.

4,544,570

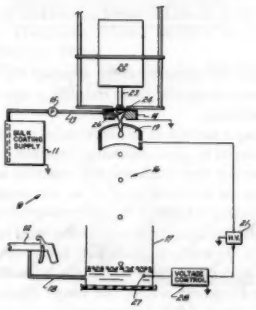
ELECTROSTATIC HIGH VOLTAGE ISOLATION SYSTEM WITH INTERNAL CHARGE GENERATION

Robert T. Plunkett, and Ion I. Inculet, both of London, Canada, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 26, 1984, Ser. No. 574,286

Int. Cl.[4] B05D *1/04;* **B05B** *5/02*

U.S. Cl. 427—27 **7 Claims**



6. A method of applying electrostatically charged coating material to objects to be coated comprising the steps of:

transferring coating material from a source of coating material to a supply of coating material, which is electrically isolated from the source of coating material, by forming transferred coating material into discrete droplets;

inducing an electrostatic charge on the discrete droplets of transferred coating material to establish an electrostatic charge on coating material in the supply of coating material; and

coupling the electrostatically charged coating material in the

supply of coating material by means of a fluid conduit to a coating material dispenser for applying electrostatically charged coating material to objects to be coated.

7. An electrostatic spray coating system comprising:

a source of coating material including a grounded coating material reservoir having a nozzle aperture in a bottom portion thereof;

a spray gun for spraying electrostatically charged coating material onto objects to be coated;

a supply container having an opening in an upper portion thereof for coating material, which is electrically isolated from the coating material reservoir and from ground;

means for coupling coating material by means of a fluid conduit from the container to the spray gun;

means for transferring coating material from the reservoir to the container by producing a pulsed jet droplet flow of coating material from the nozzle aperture into the opening of the container; and

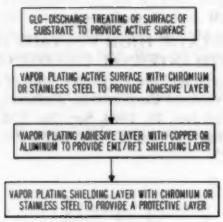
means for inducing an electrostatic charge on droplets in the pulsed jet droplet flow of transferred coating material to establish an electrostatic charge on coating material in the container which is coupled to the spray gun.

4,544,571

METHOD OF MANUFACTURE OF EMI/RFI VAPOR DEPOSITED COMPOSITE SHIELDING PANEL

Walter J. Miller, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 13, 1984, Ser. No. 579,332
Int. Cl.[4] B05D *3/06;* **H05K** *9/00*
U.S. Cl. 427—40 **9 Claims**


GLO-DISCHARGE TREATING OF SURFACE OF SUBSTRATE TO PROVIDE ACTIVE SURFACE
VAPOR PLATING ACTIVE SURFACE WITH CHROMIUM OR STAINLESS STEEL TO PROVIDE ADHESIVE LAYER
VAPOR PLATING ADHESIVE LAYER WITH COPPER OR ALUMINUM TO PROVIDE EMI/RFI SHIELDING LAYER
VAPOR PLATING SHIELDING LAYER WITH CHROMIUM OR STAINLESS STEEL TO PROVIDE A PROTECTIVE LAYER

1. A method of manufacturing a panel for shielding the passage of electromagnetic radio frequency interference therethrough, comprising:

(a) subjecting a surface of an electrically insulating substrate sheet material to glow-discharge treatment to provide an active surface that is chemically reactive with vapors of chromium or stainless steel at an air pressure less than about 5×10^{-5} TORR;

(b) vapor plating chromium or stainless steel onto said active surface to provide an adhesive layer of chromium or stainless steel chemically bound to said surface, said layer having a thickness within the range of about 300 Angstroms to about 1,000 Angstroms;

(c) vapor plating an aluminum or copper shielding layer onto the adhesive layer of (b) prior to substantial oxidation of the adhesive layer surface, said shielding layer having a thickness within the range of about 1,000 Angstroms to about 50,000 Angstroms; and then

(d) vapor plating a chromium protective layer onto said shielding layer of (c), said protective layer having a thickness of at least about 1,000 Angstroms; to provide a relatively low cost, durable, shielded panel for shielding the passage of electromagnetic radio frequency interference therethrough.

4,544,572

COATED OPHTHALMIC LENSES AND METHOD FOR COATING THE SAME

Timothy C. Sandvig, Woodville, Wis.; Dean A. Ersfeld, Maplewood, and Eric P. Berg, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 415,171, Sep. 7, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 522,554
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **19 Claims**

1. A method of providing a thin, optically clear coating to at least one optical surface of an ophthalmic device comprising the steps of:

applying a layer of a composition comprising a material containing reactive ethylenically unsaturated groups to at least a first face of a mold used to manufacture said ophthalmic device, wherein said face imparts a desired optical configuration to a first optical surface of said ophthalmic device;

reacting said composition to a degree that said composition forms a non-abrasion-resistant film that is dry, at least weakly adhered to said first face, and exactly replicates said first face in an aberration-free manner;

filling said mold with an organic liquid material capable of hardening to a solid, room temperature-stable state; and

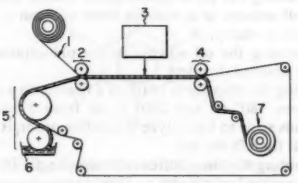
hardening said organic liquid material so as to form said ophthalmic device, intimately bond said film to the hardened organic material, render said film abrasion-resistant, and adhere said film to said optical surface of said hardened organic material more firmly that it adheres to said face.

4,544,573

PROCESS FOR CURING RADIATION CURABLE COATING MEDIA

Akihiko Dobashi; Tomohisa Ohta; Hirotsugu Himori, all of Shimodate, and Hideo Sekine, Oyama, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 23, 1984, Ser. No. 674,326
Claims priority, application Japan, Nov. 24, 1983, 58-221052
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **7 Claims**



1. A process for curing a radiation curable coating media which comprises

running a continuous belt-like substrate so as to contact a back side of a portion of the substrate with a front side of a portion of the substrate to form a laminated portion,

coating a radiation curable coating media on the front side of the substrate,

contacting the coating media coated side with the back side of the substrate at the laminated portion to exclude oxygen from the laminated portion,

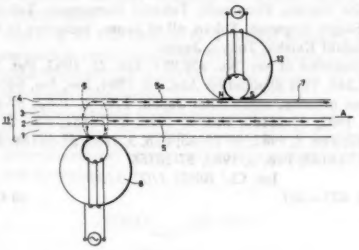
irradiating the coated coating media with a radiation to copduct corsslinking at the laminated portion, and

wind up the support having the radiation cured coating thereon on a reel.

4,544,574
METHOD OF MANUFACTURING A MAGNETIC RECORDING MEDIUM

Teruhiko Itami; Toshifumi Kimoto; Akira Yamasawa, and Koichi Saitoh, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 556,341
Claims priority, application Japan, Nov. 29, 1982, 57-207572
Int. Cl.⁴ H01F *10/02*
U.S. Cl. 427—48 **7 Claims**



1. A method for manufacturing a magnetic recording medium comprising the steps of:

forming a first magnetic layer on a non-magnetic base member;

forming a second magnetic layer over said first magnetic layer, wherein the magnetic force and the residual magnetization of said first magnetic layer is greater than said second magnetic layer;

drying said first and second magnetic layers;

orienting the magnetic particles in said first magnetic layer and said second magnetic layer in a common direction;

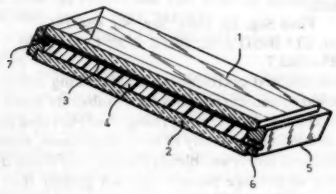
forming a repetitive magnetization pattern in said first magnetic layer and said second magnetic layer; and

erasing said repetitive magnetization pattern in said second magnetic layer by orienting the magnetic particles in said second magnetic layer in a common direction.

4,544,575
METHOD OF MAKING GLASS PANELS WITH SELECTIVE RADIATION-BLOCKING EFFECT

Bernd Melchior, Remscheid, Fed. Rep. of Germany, assignor to IMC Acrylguss GmbH, Remscheid, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,267
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3235964
Int. Cl.⁴ B05D *5/06, 5/02*
U.S. Cl. 427—74 **12 Claims**



1. A method of making a glass panel able to block certain radiation, comprising the steps of:

(a) coating one face of a first glass plate with a layer that is substantially nontransmissive for the radiation to be blocked by vapor deposition of said layer on said one face of said first glass plate;

(b) spacedly juxtaposing a second glass plate with said one face of said first glass plate;

(c) Thereafter filling the space separating said glass plates with a liquid polymerizable mass of a synthetic resin which, upon hardening, adheres to said layer; and

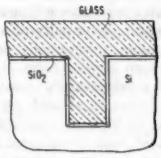
(d) allowing said mass to harden in said space.

11. The method defined in claim **1** wherein said layer is made of photoelectric material.

4,544,576
DEEP DIELECTRIC ISOLATION BY FUSED GLASS

Wei-Kan Chu; William A. Pliskin, and Jacob Riseman, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,466
Int. Cl.⁴ H01L *21/76*
U.S. Cl. 427—82 **14 Claims**



1. A method for forming high density dielectric isolation in an integrated circuit structure comprising the steps of:

forming trenches having substantially vertical sidewalls in a silicon substrate;

filling the trenches with suspension containing particles of glass having a coefficient of thermal expansion substantially the same as the substrate;

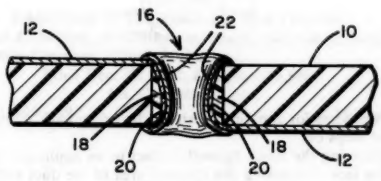
firing the structure at a temperature high enough to fuse the particles of glass and to form a continuous glass layer in the trenches; and

simultaneously planarizing the surface of said integrated circuit structure.

4,544,577
PROCESS FOR METALLIZATION OF DIELECTRIC SUBSTRATE THROUGH HOLES

Ruth A. May, Owatonna, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Apr. 26, 1984, Ser. No. 604,076
Int. Cl.⁴ B05D *5/12*
U.S. Cl. 427—97 **16 Claims**



1. A method of metallizing through holes in dielectric substrates with a metallizing material comprising:

forming a through hole in said substrate utilizing laser techniques;

depositing a first layer of material on the sidewall of said through hole to form an adhesive bridge between the sidewall of said through hole and the metallizing material; and

depositing a second layer of an electrically conductive met-

allizing material onto said first layer, said first layer comprising a glass filled dielectric material having a thermal coefficient compatible with said substrate and having properties enabling it to bond to both the sidewall of said through holes and said electrically conductive second layer.

4,544,578

METHOD OF TOUCHING UP SURFACE-BLEMISHED MATT-FINISHED SURFACE GRAINED COLORED MOLDED PLASTIC PARTS

George P. Duane, Jr., Winchester, Va., assignor to Chem-Pak, Inc., Winchester, Va.

Filed Nov. 23, 1983, Ser. No. 555,634

Int. Cl.[4] B05D *5/00;* **B32B** *35/00;* **B29H** *5/06, 5/16*

U.S. Cl. 427—140 **8 Claims**

1. A method of removing surface finish blemishes in matt-finished injected molded color-coded, grained plastic parts, which comprises spraying the surface area of said part containing such blemishes with a sprayable mixture comprised of (a) a resin component consisting essentially of a substantially non-yellowing, solvent-soluble substantially transparent, binder resin which comprises an acrylic resin, (b) a finely divided flatting pigment which is substantially transparent when in said resin component, the amount of said pigment being about 0.4–1%, and (c) about 85–95% of a volatile solvent medium effective to dissolve said resin component at least before the evaporation thereof and upon spraying on said surface area of said part to wet the same without significantly softening that surface area and thereby degrading the grained finish thereof, thereby to cover the blemished area with at least one coating of a transparent, matt-surfaced solid film of flatting pigment dispersed in said resin component and blending substantially uniformly with the original matt surface finish of said part, all percentages being by weight of the total mixture.

4,544,579

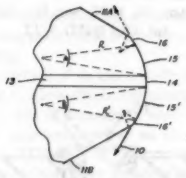
PROCESS AND APPARATUS FOR APPLYING AND CONFINING FINISH

Phillip L. Mullins, Chester, Va.; James G. Neal, Raleigh, N.C., and Jeffrey T. Perkins, Richmond, Va., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 303,330, Sep. 18, 1981, abandoned. This application May 24, 1983, Ser. No. 497,530

Int. Cl.[4] B05D *1/26*

U.S. Cl. 427—175 **4 Claims**



1. A process for applying finish to a traveling yarn, comprising the steps of:

a. metering the finish through a duct to an applicator face, the face comprising the delivery area of the duct and the surface area of two primary arcs, one of the primary arcs being located on either side of the duct and curving in the general direction of yarn travel, the central angle subtended by each of the primary arcs ranging from about 2 to 9 degrees, the edge of each of the primary arcs remote from the duct terminating in a secondary arc which subtends a central angle ranging from about 30 to 60 degrees and having a radius length shorter than that of either of the primary arcs and curving in the direction of yarn travel; and

b. simultaneously maintaining the yarn in traveling contact with the entire length of the face and the secondary arcs so that the initial and last contact of the yarn with the applicator is non-tangential to the applicator face.

4,544,580

METHOD FOR RECORDING BY WRITING OR PRINTING WITH INK

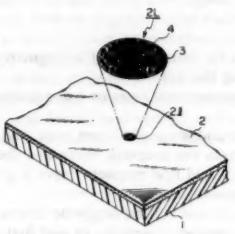
Masahiro Haruta, Funabashi; Takashi Hamamoto, Yokohama, and Shigeo Toganoh, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,987, Jan. 21, 1983, Pat. No. 4,481,244. This application Aug. 14, 1984, Ser. No. 640,751

Claims priority, application Japan, Feb. 3, 1982, 57-16159; Feb. 3, 1982, 57-16160; Feb. 3, 1982, 57-16161; Feb. 3, 1982, 57-16162; Feb. 3, 1982, 57-16163; Feb. 3, 1982, 57-16164; Feb. 3, 1982, 57-16165; Feb. 3, 1982, 57-16166

Int. Cl.[4] B05D *3/00, 5/00*

U.S. Cl. 427—261 **10 Claims**



1. A method for recording by writing or printing with ink, the method comprising the steps of:

providing a material to bear the writing or printing, said material including a substrate of a recording paper suitable for ink recording and a coating layer formed thereon of a coating material containing a polymer having both hydrophilic segments and hydrophobic segments; and

depositing ink on said material.

4,544,581

BLACK CORROSION RESISTANT COATING AND METHOD FOR A METAL SUBSTRATE

Peter E. Pelloski, Ferndale, Mich., assignor to Depor Industries, Troy, Mich.

Filed Sep. 25, 1984, Ser. No. 654,751

Int. Cl.[4] B05D *3/02;* **B05B** *7/00;* **C09D** *5/10*

U.S. Cl. 427—383.7 **20 Claims**

1. A black colored corrosion resistant coating composition for application to and curing on a metal substrate when raised to an elevated temperature, comprising: finely divided metal of the group consisting essentially of zinc, magnesium, aluminum, stainless steel, and alloys and blends thereof; said finely divided metal having an average particle size not greater than about 100 microns; a quantity of manganese dioxide equal to about 30% to 100% by weight of said finely divided metal; a quantity of a primary bonding material of a titanate polymer equal to about 9% to 47% by weight of said finely divided metal; and a vehicle of active and inactive organic solvents compatable with said titanate polymer and of sufficient quantity for the coating composition to have a viscosity in a Zahn No. 2 cup of about 20 to 150 seconds.

4,544,582
PRIMER COMPOSITIONS FOR IMPROVING ADHESION OF ABRASION RESISTANT SILICONE COATINGS TO PLASTIC SURFACES

Kelly L. Benjamin, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 467,730, Feb. 18, 1983, Pat. No. 4,486,565. This application Sep. 24, 1984, Ser. No. 653,170

Int. Cl.⁴ B05D *1/38, 7/36;* **B32B** *27/08, 27/30*

U.S. Cl. 427—407.1 **10 Claims**

1. A method of improving the durability of the adhesion of abrasion-resistant silicone coatings on plastic articles, the method comprising:

(A) applying to the surface of a plastic article a primer composition containing from 99 to 70 weight percent of organic solvent and 1 to 30 weight percent of coating components containing

(I) a thermosettable acrylic resin and

(II) from 0.1 to 50 weight percent based on (I) of an aminofunctional organo silicon compound of the general formula

$$(RO)_xO_{\frac{3-x}{2}}SiR'NHR''$$

wherein R is hydrogen or a monovalent hydrocarbon radical of 1 to 12 carbon atoms, R' is a divalent alkylene radical of 3 or 4 carbon atoms, R'' is a monovalent radical selected from the group consisting essentially of hydrogen, alkyl radicals of 1 to 4 carbon atoms and the $-CH_2CH_2NH_2$ radical, and x has an average value from 0 to 3;

(B) evaporating off a substantial portion of the organic solvent of the primer composition;

(C) thermally curing the coating components to form a primer layer on the plastic surface;

(D) applying over the primer layer, a colloidal silica filled thermoset organopolysiloxane; and

(E) thermally curing the colloidal silica filled thermoset organopolysiloxane to an abrasion-resistant silicone coating.

4,544,583
BIREFRINGENCE-FREE PLASTICS

Uwe Claussen; Hellmut Hannes, both of Leverkusen, and Hans-Leo Weber, Rommerskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 27, 1983, Ser. No. 536,411

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237480; Aug. 3, 1983, 3327929

Int. Cl.⁴ C09K *3/34*

U.S. Cl. 428—1 **12 Claims**

1. Liquid crystal display comprising a birefringence-free arrangement of plastic foils, characterized in that two plastic foils having a single principal optical axis, said optical axis lying within the plane of the plastic foil, are arranged parallel one behind the other so that the optical axes of both plastic foils are forming an angle of $90° \pm 7°$ and the material of the foil with regard to its optical properties and the thickness of the foils being selected in such a manner that the optical path differences $\Delta n_1 d_1$ for the light waves which are associated with the two main refraction indices within the first plastic foil is approximately equal to the optical path difference $\Delta n_2 d_2$ of the second foil, Δn_1, Δn_2 being the differences of the main refraction indices in the first and second foil, respectively, and d_1, d_2 standing for their thicknesses.

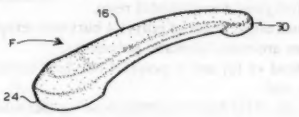
4,544,584
CULTURED ONYX PRODUCTS AND METHODS THEREFOR

Gilbert B. Ross, 17640 Vincennes St., Northridge, Calif. 91324, and Theodore E. Stevens, 295 View Crest Dr., Azusa, Calif. 91702

Division of Ser. No. 146,749, May 5, 1980, Pat. No. 4,433,070. This application Jan. 20, 1984, Ser. No. 572,358

Int. Cl.⁴ C08L *67/06;* **B29C** *9/00*

U.S. Cl. 428—15 **11 Claims**



1. The method of manufacturing a cultured onyx, cultured marble, or like mineral-appearing surface structure which includes combining with a first hardenable synthetic organic resin portion, a second visually distinguishable pre-hardened particulate synthetic organic resin portion, said first resin portion being hardenable to a like hardness to said second resin portion, hardening said first resin portion with said second resin portion distributively disposed in situ therein to said like hardness in the desired form of said structure.

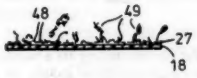
4,544,585
DRAPEABLE DECORATIVE SHEET MATERIAL

Gerhard E. Brenner, 132 Hiscock Blvd., Scarborough, Ontario, Canada (M1G 1T5)

Filed Nov. 15, 1984, Ser. No. 671,519

Int. Cl.⁴ A01N *3/00*

U.S. Cl. 428—17 **17 Claims**



1. Drapeable decorative sheet material comprising a flexible film, a flexible adhesive layer bonded to the film, and fragments of sphagnum moss adhering to and substantially covering said adhesive layer, said fragments comprising relatively large fibrous fragments of the moss upstanding from the adhesive layer and having spacings between them, and relatively smaller particulate fragments of the moss distributed on the adhesive layer between the relatively large fragments.

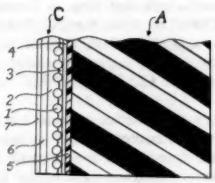
4,544,586
LAMINAR STRUCTURE OF POLYESTER

Richard E. Molari, Jr., Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 27, 1982, Ser. No. 453,558

Int. Cl.⁴ B44F *1/10*

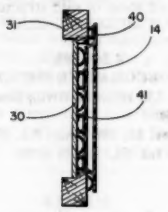
U.S. Cl. 428—29 **11 Claims**



1. An improved light reflecting sign comprising in combination:

(i) a core structure having a front face, and
(ii) a front visible light reflecting layer disposed on the front face of said core structure and bonded thereto by means of a suitable adhesive; the improvement comprising said core structure being comprised of at least one ply containing an impact modified thermoplastic polyester composition comprised of at least one thermoplastic polyester resin selected from
(a) a poly(1,4-butylene terephthalate) resin,
(b) a blend of poly(1, 4-butylene terephthalate) resin and a poly(ethylene terephthlate) resin,
(c) a block copolyester of poly(1,4-butylene terephthalate) and an aromatic/aliphatic polyester,
(d) a blend of (c) and a poly(1,4-butylene terephthalate) resin, and
(e) a blend of (c) and a poly(ethylene terephthalate) resin.

4,544,587
WINDOW INSULATOR
William A. Nesbitt, Connersville, Ind., assignor to Modern Modalities, Inc., Connersville, Ind.
Filed Jun. 4, 1984, Ser. No. 616,654
Int. Cl.[4] B32B *3/12, 3/30*
U.S. Cl. 428—34 **12 Claims**



1. A heat insulator for mounting to a window comprising:
a plurality of flexible insulator sheets of plastic material secured together being pervious to light and sized and shaped to entirely cover a window to be insulated, said plurality of sheets including a mounting surface positionable adjacent said window; and,
mounting suction means on said mounting surface and operable to removably secure said plurality of sheets to said window when said sheets are forced against said window squeezing said means against said window and creating a suction therebetween, said means including a plurality of suction cups and a plurality of grooves on said mounting surface opening outwardly towards said window with said cups arranged in rows and said grooves arranged in rows alternating with said rows of cups.

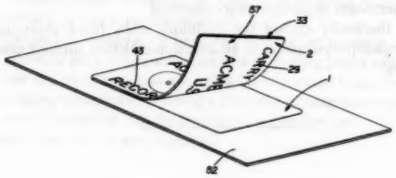
4,544,588
HOLLOW BODIES OF PLASTIC MATERIALS
Dieter Schauf, Leichlingen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 26, 1984, Ser. No. 593,279
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1983, 3312231
Int. Cl.[4] B65D *3/02*
U.S. Cl. 428—35 **6 Claims**

1. A hollow body of a plastics material having an entrance thereto and an interior contour which widens in an inward direction from the entrance and/or an interior contour having a curved cavity therein, characterized in that the hollow body includes at least two cavity-forming, aligned shells (1) having joint portions (3) connected together by an injection-moulded plastics material (4).

4,544,589
SURFACING OF BEVERAGE VESSELS
Ronald D. Sanderson, Stellenbosch, and Jurchens B. Badenhorst, Paarl, both of South Africa, assignors to Ko-Operatiewe Wijnbouers Vereniging Van Zuid-Afrika Beperkt, Suider Paarl, South Africa
Continuation of Ser. No. 475,459, Mar. 15, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 694,913
Claims priority, application South Africa, Mar. 25, 1982, 82/2044
Int. Cl.[4] B05D *7/22;* **B32B** *1/02*
U.S. Cl. 428—35 **12 Claims**

1. A method of coating an internal surface of an article to form a coating thereon which is suitable for contact with a beverage, said method comprising the steps of:
(i) applying at least one base layer to the article,
(ii) thereafter applying a barrier layer over the base layer, said barrier layer comprising
(a) a difunctional epoxy resin,
(b) an epoxy novolak resin having a functionality greaten than 2,
(c) a cycloaliphatic amine, and,
(d) stainless steel flakes in an amount of between about 10% by weight and about 70% by weight, calculated on the total weight of the constituents (a), (b) and (c), and
(iii) permitting the barrier layer to cure to form a solid coating.

4,544,590
LAMINATED MEMBER AND METHOD OF MAKING SAME
James R. Egan, Cincinnati, Ohio, assignor to Miller Products, Inc., New Philadelphia, Ohio
Filed Mar. 17, 1982, Ser. No. 359,183
Int. Cl.[4] B32B *31/04, 31/12;* **B42D** *15/00*
U.S. Cl. 428—40 **14 Claims**

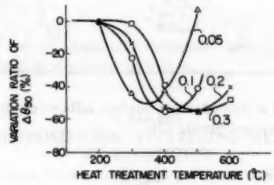


1. A laminated member including:
(a) a carrier having an adhesive release coating applied to one side thereof;
(b) a first sheet of plastic having a pressure-sensitive adhesive on one side thereof releasably securing said first sheet of plastic on the side of the carrier having the release coating;
(c) a second sheet of plastic releasably secured generally throughout one side to another side of the first sheet of plastic;
(d) a top sheet of material having printed indicia thereon secured to another side of the second sheet of plastic; and
(e) said sheets of plastic being releasably secured together with a greater force than the force provided by the adhesion between the first sheet of plastic and the carrier whereby the carrier may be stripped from the first sheet of plastic with said pressure-sensitive adhesive remaining on said first sheet for subsequent attachment of the joined plastic sheets and top sheet of material by said adhesive to a base sheet of material with said sheets of plastic being subsequently completely disengageable fom each other to provide two separated members without adhesive being exposed on either of the separated members.

4,544,591
PERPENDICULAR MAGNETIC RECORDING MEDIUM

Yasutaro Uesaka, Kokubunji; Sadao Hishiyama, Sayama; Masahiro Kitada, Tokyo; Noboru Shimizu, Tokorozawa; Hideo Tanabe, Hachioji, and Hideo Fujiwara, Tokorozawa, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Maxell, Ltd., Osaka, both of, Japan

Filed Sep. 30, 1983, Ser. No. 537,512
Claims priority, application Japan, Oct. 1, 1982, 57-171058
Int. Cl.[4] G11B *25/04*
U.S. Cl. 428—65 25 Claims

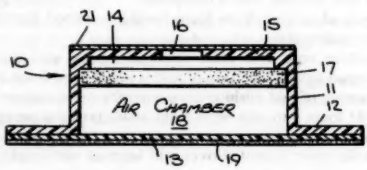


1. A perpendicular magnetic recording medium comprising a non-magnetic substrate; a permanent magnet film formed on said non-magnetic substrate, said permanent magnet film having a thickness from 0.02 μm and up to 1/5 the width of a track on said medium, and a coercive force of at least 100 Oe; a high permeability film formed on said permanent magnet film, said high permeability film having a thickness of 0.1–5 μm; and a perpendicular magnetization film formed on said high permeability film, said perpendicular magnetization film having a thickness of 0.03–0.3 μm, whereby said permanent magnet film formed on said non-magnetic substrate acts to eliminate occurrence of spike noise in said recording medium.

4,544,592
AROMA-GENERATING CAPSULE

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Oct. 1, 1984, Ser. No. 656,768
Int. Cl.[4] B32B *3/16*; A61L *9/02*
U.S. Cl. 428—68 7 Claims



1. An aroma generating miniature capsule attachable to the contoured surface of an incandescent light bulb to be activated by heat emanating therefrom, the capsule comprising:

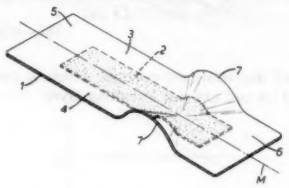
A. an envelope of flexible skin material defining an internal cavity bounded by a top wall having a vent hole therein and a base wall having a heat-resistant pressure-sensitive outer coating thereon, whereby the capsule may be adhesively attached to the bulb surface to conform thereto; and

B. a pad of porous material impregnated with a volatile aromatic liquid supported within the cavity at a position adjacent the top wall to define an entrapped air pocket therebelow, whereby when the air in the pocket is heated and expanded by the heat emanating from the bulb, the resultant positive pressure forces the heated air through the pad to volatilize the liquid to produce an aromatic vapor which is discharged into the atmosphere through the vent hole.

4,544,593
SEALING STRIP

Bernhard Borgert, and Udo Liche, both of Mannheim, Fed. Rep. of Germany, assignors to Braas & Co., Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,076
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 8215946[U]
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.[4] B32B *3/02*; E04C *1/00*
U.S. Cl. 428—80 16 Claims

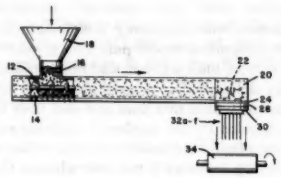


1. A sealing strip made of a weather-resistant elastomer or plastomer for outer corners on flat roofs and other engineering constructions, which comprises, in a zone positioned intermediate its ends, at least one pair of areas in the form of oppositely directed waves whose amplitudes and wave-lengths increase regularly from the centre line of the strip toward its longitudinally extending edges, so that said zone comprises a planar basal surface and an additional curved aplanar sectorial surface corresponding to each wave.

4,544,594
FOAMED POLYAMIDE FIBERS

Hsin L. Li, Parsippany, and Hendrikus J. Oswald, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 490,070, Apr. 29, 1983,. This application Dec. 7, 1984, Ser. No. 679,521
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—92 6 Claims



1. A foamed polyamide fiber having an effective diameter of between about 0.01 and about 1.0 mm and a plurality of predominantly closed-cell bubbles of diameter less than one-twentieth the effective diameter of the polyamide fiber.

4,544,595
PREFABRICATED PANEL FOR ROOF OR SIDING CONSTRUCTION

Garry Tomason, 1894A El Parque Ct., San Mateo, Calif. 94403

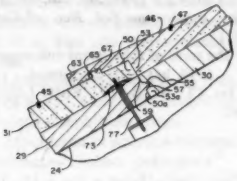
Filed May 19, 1983, Ser. No. 496,195
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 2 Claims

1. An improved pre-fabricated panel for roof or siding construction comprising

a substantially rigid and planar inner decking material fabricated of a honeycomb fiberglass sheet material,

a thin flat sheet of fiberglass secured to the bottom side of the decking material,

a top exterior insulating layer composed by volume of approximately 80 percent biosilicate hollow glass beads and 20 percent fire-retardant suspension material, and



a coating of fire retardant material which is evaporation deposited on said exterior insualting layer.

4,544,596

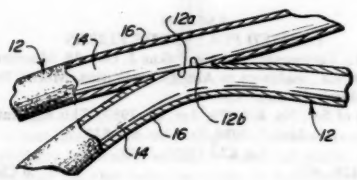
STABILIZED ABSORBENT STRUCTURE CONTAINING NON-DELIGNIFIED WOOD PULP FIBERS

Dennis C. Holtman, Flemington, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Apr. 18, 1984, Ser. No. 601,756

Int. Cl.⁴ D21F *7/00*; D21H *3/00*

U.S. Cl. 428—171 **16 Claims**



1. An absorbent batt comprising: a web including an assemblage of non-delignified wood pulp fibers, said web having compressed narrow lines wherein said fibers in said lines are at least partially delignified at fiber intersections by ultrasonic energy treatment within said lines and said fiber intersections are hyrogen bonded to one another to stabilize said batt, said lines providing a fluid distribution network within said batt and having a width up to about ¼ inch and wherein the density in said lines is at least 0.2 gm/cc.

4,544,597

CORRUGATED PAPER BOARD AND ITS METHOD OF MANUFACTURE

Albert D. Peer, Jr., Parker, and Paul T. Obolewicz, Arvada, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

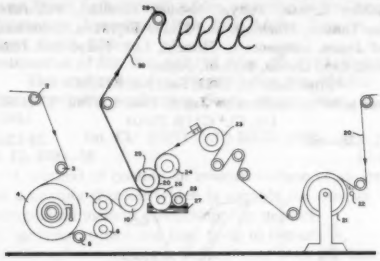
Filed Nov. 12, 1982, Ser. No. 441,277

Int. Cl.⁴ B32B *3/28, 27/10*

U.S. Cl. 428—182 **14 Claims**

1. A decorative preprinted corrugated paperboard product comprising:

a fluted paperboard corrugated medium and at least one paperboard facing sheet adhesively attached thereto; said one paperboard facing sheet comprising a single sheet containing two surfaces, with a first inner surface adhesively bonded to the fluted paperboard corrugated medium and a second outer surface adhesively bonded to a reverse printed plastic film.



4,544,598

SEAT CUSHION WITH A TEXTILE COVER

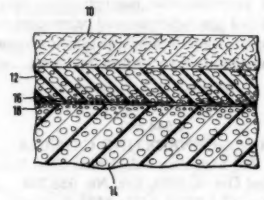
Hermann Meiller, and Helmut Storch, both of Amberg, Fed. Rep. of Germany, assignors to Willibald Grammer, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,633

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230321

Int. Cl.⁴ B32B *5/32, 7/04*

U.S. Cl. 428—246 **1 Claim**



1. A seat cushion which comprises:

a layer of a lined from foam having a flamed formed air permeable skin;

a cushion core cold foam disposed against said skin and formed against said skin of said layer of lined foam during foaming of said cushion core whereby penetration of said cold foam into said lined foam is substantially prevented; and

a textile cover mounted over said layer of lined foam.

4,544,599

ELASTICALLY DEFORMABLE ARTICLES OF CARBON FIBERS, AND METHOD FOR PRODUCING THE SAME

Bernard Buttazzoni, Marseilles, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Continuation-in-part of Ser. No. 463,162, Feb. 2, 1983, abandoned. This application May 30, 1984, Ser. No. 615,137

Claims priority, application France, Feb. 9, 1982, 82 02094

Int. Cl.⁴ B32B *7/00*

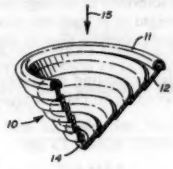
U.S. Cl. 428—262 **11 Claims**

11. An elastically deformable article constituted of a substrate which is elastically deformable with respect to an at rest shape, said article comprising:

a starting flexible textile formed of a plurality of carbon fibers which textile is capable of being reversibly deformed,

said starting textile having a thin coating of rough laminar pyrolytic carbon, of a thickness of less than about 1.5

micron, around each of said plurality of carbon fibers said fibers not being bonded with one another wherein said



article can be elastically deformed without breakage of said coating of pyrolytic carbon.

4,544,600

RESIN COMPOSITIONS CONTAINING METALS SUCH AS ALUMINUM

George M. Kern, Schnecksville, Pa., assignor to Silberline Manufacturing Company, Inc., Lansford, Pa.

Filed Aug. 16, 1982, Ser. No. 408,666
Int. Cl.⁴ B32B *5/16, 15/02, 15/08*
U.S. Cl. 428—323 **62 Claims**

1. A substrate having a coating, said coating comprising metal particles and mixture of resins, said metal particles being coated with said resins and being in a proportion of at least about 0.5% by weight and said resin comprising a terpene phenol resin having a softening point range from about 70° to 195° C. and a low density polyethylene resin having a softening point range of 90° to 135° C. and a molecular weight range from about 2,000 to 15,000, said coated metal particles prior to forming said coating on said substrate being flowable and non-self adhesive,

said coating being of virtually uniform metal distribution, exhibiting a uniform metallic sheen, satin-like appearance and high reflectance with no visible blotches or agglomeration.

7. A flowable non-self-adhesive composition which comprises metal particles which are coated with a coating wherein

(1) the metal is selected from the group of aluminum, brass, bronze, copper, iron, lead, nickel, tin, zinc and gold or an alloy thereof, and

(2) the coating comprises a mixture of (a) a terpene phenol resin and (b) at least one member of the group consisting of a plasticizer and mineral oil,

said metal being present to a percentage by weight where but for the presence of the terpene phenol resin, the concentrate made from said composition is not stable,

said terpene phenol resin being present in an amount of at least about 0.5% by weight,

said composition being especially suited for making uniform concentrates for use in films and coatings, said concentrates having improved shelf life.

4,544,601

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Shinobu Iida; Toshimitu Okutu; Takahito Miyoshi; Eiichi Tadokoro, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 7, 1984, Ser. No. 586,919
Claims priority, application Japan, Mar. 7, 1983, 58-36906
Int. Cl.⁴ G11B *5/72*
U.S. Cl. 428—330 **49 Claims**

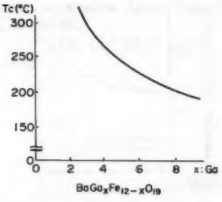
1. A magnetic recording medium comprising a nonmagnetic supporting having coated thereon a magnetic recording layer comprising a ferromagnetic powder and a binder and a backing layer on the surface opposite to the magnetic recording layer, said backing layer containing (1) carbon black having an average particle size in the range of about 10 mμ to about 150 mμ and (2) surface treated hydrophobic calcium carbonate.

4,544,602

MAGNETO-OPTICAL RECORDING MEDIUM HAVING A FERRIMAGNETIC RECORDING LAYER

Hiroshi Kobayashi; Hazime Machida, both of Tokyo, and Motoharu Tanaka, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 16, 1984, Ser. No. 590,140
Claims priority, application Japan, Mar. 17, 1983, 58-43232
Int. Cl.⁴ G11B *11/10*
U.S. Cl. 428—336 **7 Claims**



1. A magneto-optical recording medium comprising a transparent substrate, a vertical magnetic-anisotropic magnetic film layer formed thereon, which magnetic film layer comprises a ferrimagnetic oxide of the following formula:

$$MeGa_xFe_{12-x}O_{19}$$

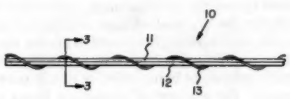
wherein Me represents an element selected from the group consisting of Ba, Sr and Pb, and x is an integer of 3 to 8, and a reflection layer formed on said vertical magnetic-anisotropic magnetic film layer.

4,544,603

REINFORCING ELEMENT FOR ELASTOMERIC ARTICLES AND ELASTOMERIC ARTICLES MADE

Jimmy L. Richards, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 523,304, Aug. 15, 1983, abandoned.
This application Apr. 8, 1985, Ser. No. 720,058
Int. Cl.⁴ D02G *3/00;* **B60C** *5/00*
U.S. Cl. 428—371 **12 Claims**



1. A reinforcing element for an elastomeric article comprising a plurality of elongated metallic members having substantially rectangular cross sections of identical width, the longitudinal axes of said elongated metallic members being parallel to one another, a wide side of each said elongated metallic member being contiguous with a wide side of another of said elongated metallic members, the ratio of width to thickness of each said elongated metallic member being at least 2 to 1 but no greater than 10 to 1, and a wrap member helically disposed around said elongated metallic members such that each turn of said wrap member is spaced apart from the next adjacent turns of said wrap member a distance, as measured in a direction parallel to the longitudinal axes of said elongated metallic members, that is at least equal to the width of one of said elongated metallic members.

4,544,604

HEAT-SENSITIVE RECORDING PAPER AND FILLER THEREFOR

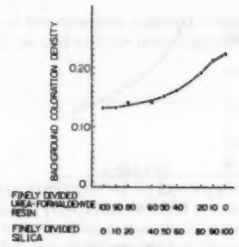
Koichi Usui; Masahide Ogawa, both of Shibata; Kunio Goto, Nakajo; Teiji Sato; Masanori Tanaka, both of Shibata; Seikichi Takahashi, Nakajo; Kinichi Ono, Kurokawa, and Seiji Kojima, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Osaka, Japan

Division of Ser. No. 574,574, Jan. 27, 1984, Pat. No. 4,509,064. This application Jan. 3, 1985, Ser. No. 688,539

Claims priority, application Japan, Sep. 13, 1983, 58-167474

Int. Cl.[4] B32B *9/00, 19/00;* **B41M** *5/18, 5/22*

U.S. Cl. 428—402 **8 Claims**



1. A filler for a heat-sensitive recording paper comprising finely divided amorphous silica having a BET specific surface area of 10 to 100 m^2/g and a bulk density of 0.14 to 0.30 g/cc, said finely divided amorphous silica having such a secondary particle size distribution that secondary particles having a size smaller than 4 microns, as measured by the centrifugal precipitation method, occupy at least 90% by weight of the total particles.

4,544,605

PHOSPHOR

Tomohiro Miyazaki; Hitoshi Tanaka; Goro Matsumoto; Noboru Matsuhisa, and Susumu Omatoi, all of Odawara, Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Aug. 23, 1983, Ser. No. 525,722

Claims priority, application Japan, Aug. 23, 1982, 57-145994

Int. Cl.[4] C09K *11/00*

U.S. Cl. 428—404 **2 Claims**

1. A phosphor having formed on its surface a surface treating substance having a generally spherical shape, wherein said surface treating substance is composed of SiO_2 in amounts of 0.01 to 1.0 part by weight, an aluminum compound wherein the amount of aluminum in the aluminum compound is at most 0.1 part by weight, and a zinc compound wherein the amount of zinc in the zinc compound is from 0.003 to 0.25 part by weight, all of said parts by weight being relative to 100 parts by weight of the phosphor; the amount of aluminum being sufficient to effect a lower glass surface fogging than said surface treating substance absent the aluminum compound; at least 70% by weight of the surface treating substance having an average particle size within a range of from 60 to 300 mμm.

4,544,606

FIBRILLED POLYMERIC FILMS AS REINFORCEMENT IN MANUFACTURED PRODUCTS BASED ON HYDRAULIC BINDERS

Pierpaolo Camprincoli, Terni; Enzo Marcaccioli, Perugia, and Luciano Rosati, Stroncone, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 195,937, Oct. 10, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,786

Claims priority, application Italy, Oct. 12, 1979, 26463 A/79

Int. Cl.[4] B32B *5/16;* **B29H** *9/02*

U.S. Cl. 428—454 **8 Claims**

1. Reinforcement for manufactured products based on hydraulic binders, said reinforcement consisting of a fibrillated film or flat net-shaped structure made of at least one polyolefin selected from the group consisting of polyethylene and polypropylene, and characterized in having, incorporated therein, from 3 to 18% by weight of at least one cement-based material and in having a specific surface area in the range 0.25 to 1.3 m^2/g.

8. Composite plates consisting of layers of a fibrillated or net-like structure according to claim 1 alternating with layers of cement.

4,544,607

ENGINE PARTS

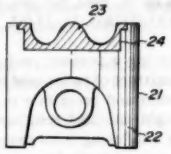
Isao Oda, Nagoya, and Masayuki Kaneno, Tokoname, both of Japan, assignor to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 420,341, Sep. 20, 1982, abandoned, which is a continuation of Ser. No. 282,518, Jul. 13, 1981, abandoned. This application Apr. 4, 1984, Ser. No. 596,566

Claims priority, application Japan, May 21, 1981, 56-75623

Int. Cl.[4] C04B *35/48;* **B32B** *15/04*

U.S. Cl. 428—472 **7 Claims**



1. A ceramic engine part which consists essentially of partially stabilized zirconia and a metal part bonded thereto, said partially stabilized zirconia consisting of a monoclinic crystal phase of zirconia in an amount less than 10% and either a tetragonal crystal phase of zirconia or a mixture of a tetragonal crystal phase of zirconia and a cubic phase of zirconia, and having a four point bending strength of at least 50 kg/mm^2, and a thermal expansion hysteresis which provides for a maximum difference in expansion percents of 0.4% existing between the thermal expansion heating curve and the thermal expansion cooling curve at any temperature occurring between room temperature and approximately 1000° C.

4,544,608

METHOD OF MANUFACTURING AQUEOUS FORTIFIED ROSIN DISPERSION

Yasutaka Nishi, Takasago; Masao Hamada, Kakogawa; Yoshihide Ishikawa, Kakogawa, and Setsuo Inoue, Kakogawa, all of Japan, assignors to Harima Chemicals, Inc., Kakogawa, Japan

Continuation-in-part of Ser. No. 436,646, Oct. 25, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,893

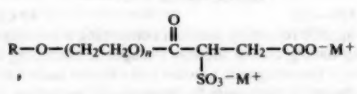
Int. Cl.[4] B32B *9/06;* **C08L** *93/04*

U.S. Cl. 428—498 **13 Claims**

1. A method of manufacturing an aqueous O/W dispersion of a fortified rosin by mixing said fortified rosin with water and a dispersing agent, comprising:

(a) first forming a dispersion of the w/o type in the presence of said dispersing agent; and

(b) converting said W/O dispersion to said O/W dispersion by sequential addition of water thereto, wherein said dispersing agent has the general formula:



in which R is an straight- or branched-chain alkyl group

having 4 to 24 C atoms, n is an integer of 6 to 20, and M^+ is a cation selected from the group consisting of Na^+, K^+, and NH_4^+.

4,544,609

COMPOUNDS AND THEIR USE AS INSOLUBILIZERS FOR BINDERS FOR PAPER COATING COMPOSITIONS

Sai H. Hui, Rock Hill, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 12, 1984, Ser. No. 649,610
Int. Cl.[4] B32B *23/08*
U.S. Cl. 428—507 **13 Claims**

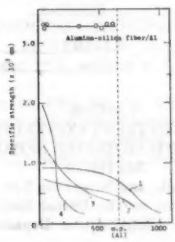
1. An insolubilizer for binders for paper coating compositions which comprises the product of the reaction of (a) about 1.65 to 12,000 parts by weight of a polyacrylamide, (b) about 1.35 to 500 parts by weight of glyoxal, and (c) about 1 to 250 parts by weight of a urea or a cyclic urea, the reaction being carried out at a temperature within the range of about 25° to 100° C. and the binder being selected from the group consisting of starch; oxidized starch; enzyme-converted starch; starches having hydroxyl, carboxyl, amido, or amino groups; proteins; and their mixtures.

4,544,610

HEAT-RESISTANT SPRING MADE OF FIBER-REINFORCED METALLIC COMPOSITE MATERIAL

Hideho Okamoto, Toyonaka, and Ken-ichi Nishio, Ibaraki, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 180,870, Aug. 25, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,756
Claims priority, application Japan, Aug. 29, 1980, 54-110762
Int. Cl.[4] F16F *1/04, 1/18*
U.S. Cl. 428—611 **3 Claims**



1. A heat resistant leaf spring or coil spring exhibiting excellent creep characteristics, fatigue properties and impact resistance at high temperatures comprising a fiber-reinforced metallic composite material including a metal matrix having a melting point of not higher than 1700° C. reinforced by an inorganic fiber having a high specific modulus of elasticity and a high specific strength comprising an alumina-silica fiber containing from about 98 to 75 percent by weight of Al_2O_3 and 2 to 25 percent by weight of SiO_2, said fiber having substantially no α-alumina reflection by X-ray diffraction.

4,544,611

CONDUCTIVE ELEMENT METALLIZED WITH A THICK FILM SILVER COMPOSITION

Joseph R. Rellick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 442,954, Nov. 19, 1982, Pat. No. 4,462,827. This application Apr. 27, 1984, Ser. No. 604,588
Int. Cl.[4] H01B *1/02, 5/00*
U.S. Cl. 428—673 **3 Claims**

1. A conductive element comprising a conductive metal substrate having a conductive silver layer affixed thereon by screen printing a thick film silver composition containing:

65 to 95% by weight of silver particles, and 5 to 35% by weight of particles of an alloy of cadmium and antimony having an antimony content of 25–80% by weight

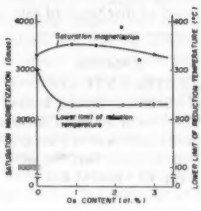
on the metal substrate and thereafter firing and sintering.

4,544,612

IRON OXIDE MAGNETIC FILM AND PROCESS FOR FABRICATION THEREOF

Osamu Ishii; Fumikatsu Yoshimura, and Iwao Hatakeyama, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,978
Claims priority, application Japan, Sep. 22, 1982, 57-164134; Jul. 15, 1983, 58-127786
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—692 **8 Claims**


Saturation magnetization
Lower limit of reduction temperature
SATURATION MAGNETIZATION (Gauss)
LOWER LIMIT OF REDUCTION TEMPERATURE (°C)
Os CONTENT (at. %)

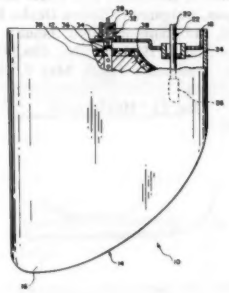
1. A γ-Fe_2O_3 magnetic film fabricated on a substrate by reactive sputtering, consisting essentially of: iron and a metal additive selected from the group consisting of at least one of Pd, Au, Pt, Rh, Ru, Ir, Os and mixtures thereof.

4,544,613

ELECTROCHEMICAL CELL HAVING CONTINUOUS DEPLETION GAUGE

Abel DeHaan, Pembroke Pines, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 8, 1984, Ser. No. 669,605
Int. Cl.[4] H01M *10/48*
U.S. Cl. 429—91 **33 Claims**



1. An electrochemical cell comprising: an outer conductive housing; a cathode material within said housing, said cathode material being in direct electrical contact with said housing; at least a first anode material within said housing, said first anode material including first and second major surfaces; porous insulating means separating said cathode material from said first anode material; an electrolyte within said housing and within said porous insulating means; a conductive resistive

strip member positioned within said first anode material, having a distal end and a proximal end and extending generally diagonally through said first anode material between said major surfaces of said first anode material; means for insulating said strip member from said first anode material; means for establishing electrical connections between said first anode material and said conductive strip member, said means for establishing electrical connections being capable of being rendered non-conductive when in contact with said electrolyte; and an electrical conductor connected to said proximal end of said strip member and extending out of and insulated from said conductive housing whereby an initial voltage is developed between said electrical conductor and said housing and, as the anode material is used up and more electrical connections are rendered non-conductive, the number of non-conductive electrical connections between said electrolyte and said conductive strip member controls the amount of electrical resistance of said strip member between said first anode material and said electrical conductor, the increase in resistance of said strip member during consumption of said first anode material serving to indicate the level of discharge of said cell.

4,544,614

GLASS ELECTROLYTE COMPOSITION

Gene H. Kucera, and Michael F. Roche, both of Downers Grove, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 8, 1985, Ser. No. 689,735
Int. Cl.[4] H01M *6/18*
U.S. Cl. 429—193 **9 Claims**

1. An ionically conductive glass having an ionic conductivity in excess of 2×10^{-3} (ohm-cm)$^{-1}$ at 300° C. comprising by mole %:

40–48% Na_2O
6–14% ZrO_2
0.1–18% Al_2O_3
30–52% SiO_2

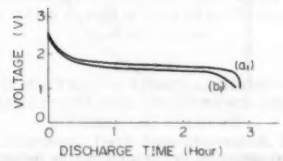
said glass being substantially resistant to chemical attack by molten sodium metal, molten sulfur including polysulfides at electrochemical cell operating conditions of 300°–400° C.

4,544,615

BATTERY HAVING ELECTRODE MADE OF POLYMERIC COMPOUND HAVING CONJUGATED DOUBLE BONDS

Toshikazu Shishikura; Hiroshi Konuma, both of Yokohama; Hidenori Nakamura, Kawasaki, and Yukio Kobayashi, Setagaya, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Hitachi, Ltd., both of Tokyo, Japan

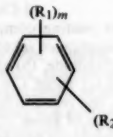
Filed May 3, 1984, Ser. No. 606,749
Claims priority, application Japan, May 4, 1983, 58-77509; May 4, 1983, 57-77510
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **17 Claims**



1. A battery comprising as at least one electrode a polymeric compound having conjugated double bonds in the main chain, and an electrolytic solution comprising an organic solvent and an electrolyte therein, said organic solvent being at least one member selected from the group consisting of nitrile compounds represented by the following general formulae (I) and (II):

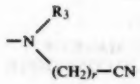
$$R—CN \quad (I)$$

wherein R stands for an alkyl group having 2 to 7 carbon atoms, a saturated alicyclic hydrocarbon residue having 3 to 7 carbon atoms or a group $CH_3—(CH_2)_x—O—(CH_2—)_y$ or $NC—(CH_2—)_z$ in which x, y and z stand for 0 or a positive integer of up to 5, and



(II)

wherein R_1 stands for a group $—(CH_2)_p—CN$, $—O—(CH_2)_q—CN$ or



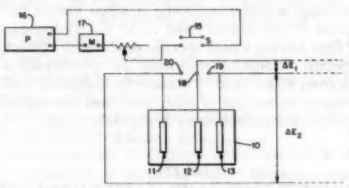
in which R_3 stands for an alkyl group having up to 5 carbon atoms and p, q and r stand for 0 or a positive integer of up to 5, R_2 stands for an alkyl or alkoxy group having up to 5 carbon atoms or a group $—(—CH_2)_t—CN$, in which l stands for 0 or a positive integer of up to 3, m is a positive integer of up to 3, and n is 0 or a positive integer of up to 3.

4,544,616

SECONDARY BATTERY CONTAINING ZINC ELECTRODE WITH MODIFIED SEPARATOR AND METHOD

David S. Poa, Naperville, and Neng-Ping Yao, Clarendon Hills, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 16, 1984, Ser. No. 580,982
Int. Cl.[4] H01M *2/16*
U.S. Cl. 429—229 **20 Claims**

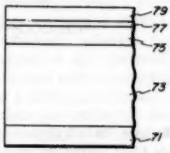


1. In a battery containing a zinc electrode having a porous separator between the anode and cathode, the improvement comprising providing the separator with an organic tertiary amine selected from the class consisting of triheptylamine; trihexylamine; tripentylamine; tri-n-octylamine, and tridecylamine to reduce the rate of zinc dentrite growth in the separator during battery operation.

4,544,617
ELECTROPHOTOGRAPHIC DEVICES CONTAINING OVERCOATED AMORPHOUS SILICON COMPOSITIONS

Joseph Mort, Webster; Frank Jansen, Walworth; Steven J. Grammatica, East Rochester, and Michael A. Morgan, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1983, Ser. No. 548,117
Int. Cl.⁴ G03G *5/082, 5/09, 5/14*
U.S. Cl. 430—58 **23 Claims**

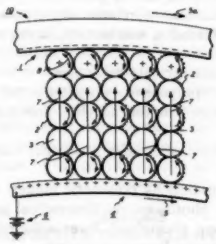


1. An electrophotographic photoresponsive device consisting essentially of in the order stated a supporting substrate, an amorphous silicon hydrogen charge transport layer, a carrier photogenerating layer comprised of an alloy of amorphous silicon hydrogen, a trapping layer comprised of doped amorphous silicon, and a protective top insulating overcoating layer.

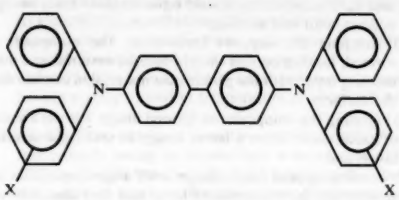
4,544,618
DEVELOPMENT PROCESS UTILIZING CONDUCTIVE MATERIALS

John J. Kopko, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 18, 1982, Ser. No. 340,570
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.
Int. Cl.⁴ G03G *13/08, 13/09*
U.S. Cl. 430—102 **13 Claims**



1. An improved process for causing the development of electrostatic latent images on an imaging member, comprising providing a development zone ranging in length of from about 0.5 centimeters to about 5 centimeters, which development zone is encompassed by a tensioned deflected flexible imaging member and a transporting member, wherein the flexible imaging member is comprised of a supporting substrate, a photogenerating layer, and a transport layer comprised of electrically active diamine molecules dispersed in an inactive resinous binder, the diamine molecules being of the formula

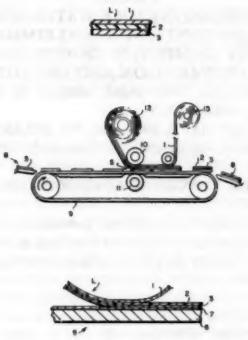


wherein X is selected from the group consisting of (ortho) CH_3, (meta) CH_3, (para) CH_3, (ortho) Cl, (meta) Cl, (para) Cl, causing the deflected flexible imaging member to move at a speed of from about 5 cm/sec to about 80 cm/sec, causing the transporting member to move a speed of from about 6 cm/sec to about 160 cm/sec, said deflected flexible imaging member and said transporting member moving at different rates of speed, maintaining a distance between the flexible imaging member and the transporting member of from about 0.05 millimeters to about 1.5 millimeters, adding conductive developer particles to the development zone, which particles are comprised of toner particles and conductive magnetic carrier particles, introducing a high electrical field in the development zone, wherein the developer particles contained in the development zone are agitated, thereby providing contact between the conductive carrier particles, causing charge to rapidly flow in the direction of deflected flexible imaging member, said process being accomplished in the presence of a low magnetic field of less than 150 gauss, and wherein the development time is from about 0.83 seconds to about 0.0031 seconds.

4,544,619
PHOTOSENSITIVE LAMINATE

Carl W. Christensen, and Calvin Isaacson, both of Beverly, Mass., assignors to Shipley Company Inc., Newton, Mass.

Division of Ser. No. 253,865, May 16, 1972, Pat. No. 4,530,896, which is a continuation of Ser. No. 16,145, Mar. 3, 1970, abandoned. This application Feb. 29, 1984, Ser. No. 584,775
Int. Cl.⁴ G03C *11/12, 5/00;* **G03F** *7/26*
U.S. Cl. 430—258 **10 Claims**



1. A process for forming a photoresist on a surface which comprises

(a) adhering a light sensitive laminate to said surface to form a composite, said light sensitive laminate comprising an undeveloped light sensitive layer of a photoresist material free of photographic silver halide emulsion, a support layer therefor and a light transmitting intermediate protective layer between said light sensitive layer and said support layer, said light sensitive layer being firmly adhered to said intermediate layer and said support layer

being loosely adhered to said intermediate layer relative to said light sensitive layer, said light sensitive layer being in contact with said surface;

(b) stripping the support layer from the composite so formed, leaving behind the photoresist material and intermediate layer with the photoresist material in contact with the surface;

(c) exposing the composite so formed image wise to a source of radiation to form a latent image in said light sensitive layer; and

(d) developing said latent image with a developer that is a solvent for the intermediate layer and first dissolves said intermediate layer and then develops the light sensitive layer.

4,544,620

TANNABLE MULTI-COLORED MATERIAL

Michael T. Macioch, Baldwin, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 25, 1984, Ser. No. 614,296

Int. Cl.[4] G03C *1/06, 7/10*

U.S. Cl. 430—264 **21 Claims**

1. A tannable photographic element capable of providing a multi-colored image which is layered structure comprising

a. a base support, and

b. coated thereon in either order or in unitary layer,

(1) a layer comprising colloidal silver having in the range of 0.05 to 1.5 g of Ag/m^2, and

(2) a layer comprising a light-sensitive silver halide emulsion in gelatin substantially free of hardener,

at least one colored pigment or colored dye that absorbs radiation in the range of 300 to 1000 nm in sufficient quantity to provide a reflection or transmission optical density in the range of 1.0 to 5.0, said colored pigment or colored dye being dispersed in at least one of the colloidal silver and the light-sensitive layers;

the total silver in said layer of light-sensitive emulsion and said colloidal silver layer being present in a quantity in the range of 0.5 g/m^2 to 5 g/m^2, and the gelatin of said emulsion layer being present in a quantity so as to provide a total silver/total gelatin weight ratio of less than 1.5.

4,544,621

PHOTOCROSSLINKABLE WATER-SOLUBLE POLYMERS, CONTAINING MALEIMIDYL AND QUATERNARY AMMONIUM GROUPS PROCESS FOR THEIR PREPARATION AND USE THEREOF

Martin Roth, Giffers, Switzerland, assignor to CIBA GEIGY Corporation, Ardsley, N.Y.

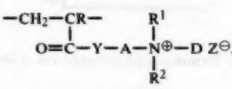
Filed May 9, 1983, Ser. No. 492,853

Claims priority, application Switzerland, May 19, 1982, 3128/82

Int. Cl.[4] G03C *1/68;* **C08F** *226/06*

U.S. Cl. 430—271 **8 Claims**

1. A homopolymer or copolymer containing maleimidyl and quaternary ammonium groups and having a molecular weight of at least 1000, which polymer contains structural units of the formula I



(I)

wherein

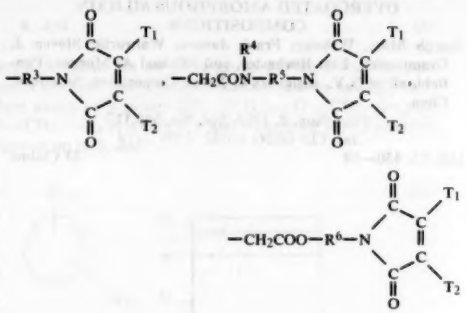
R is a hydrogen atom or a methyl group,

Y is an oxygen atom or the —NH group,

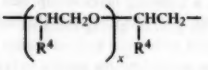
A is a linear or branched C_2–C_6 alkylene group,

R_1 and R_2 independently of each other are C_1–C_4 alkyl or together are tetramethylene, pentamethylene or 3-oxapentylene,

D is a radical of the formula



wherein R^3 is alkylene, oxaalkylene or benzylene, R^4 is a hydrogen atom or C_1–C_4alkyl, R^5 is a bivalent aliphatic, cycloaliphatic or aromatic hydrocarbon radical or a bivalent aliphatic or aromatic heterocyclic radical containing up to 18 carbon atoms, and R^6 has the meaning of R^5 or is



wherein x is a value from 1 to 29 and R^4 is hydrogen atom or C_1–C_4alkyl; and T_1 and T_2 independently of each other are C_1–C_4alkyl or together are unsubstituted or C_1–C_4alkyl-substituted trimethylene or tetramethylene, and $Z^{\ominus}$ is an anion.

4,544,622

NEGATIVE-ACTING PHOTORESIST IMAGING SYSTEM

William L. Kausch, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 19, 1984, Ser. No. 632,339

Int. Cl.[4] G03C *1/68, 1/70, 1/94*

U.S. Cl. 430—278 **23 Claims**

1. A negative-acting photoresist imaging system comprising:

(a) a substrate;

(b) a metal layer adhered to said substrate;

(c) a latently sensitized crosslinkable, negative-acting photoresist base layer adhered to said metallic layer, said base layer comprising:

(i) a polyfunctional acrylate monomer;

(ii) an organic, polymeric, polyfunctional film-forming binder with more than one acryloyl group pendant therefrom;

(iii) a polyfunctional, thermally activated, acid group crosslinking agent;

(iv) an acid group-bearing polymeric binder; and

(v) a non-active, photosensitive free-radical generator; and

(d) a negative-acting photoresist layer adhered to said base layer, said photoresist layer comprising:

(i) a polyfunctional acrylate monomer;

(ii) an organic, polymeric, polyfunctional film-forming binder with more than one acryloyl group pendant therefrom;

(iii) a polyfunctional, thermally activated, acid group crosslinking agent;

(iv) an acid group-bearing polymeric binder;

(v) a non-active, photosensitive free-radical generator; and

(vi) an active, photosensitive free-radical generator.

5. An imaging system as claimed in claim 1, wherein said metal layer is aluminum.

4,544,623

PHOTOSENSITIVE COATING COMPOSITION AND THE USE THEREOF FOR PROTECTIVE PURPOSES

Thaddeus Audykowski, Allschwil; Anton Mentha, Endingen, and Ewald Losert, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 415,493, Sep. 7, 1982, abandoned. This application Jan. 23, 1984, Ser. No. 573,098

Claims priority, application Switzerland, Sep. 17, 1981, 6007/81

Int. Cl.⁴ G03C *1/68, 5/16*

U.S. Cl. 430—280 **16 Claims**

1. A curtain coating composition yielding uniform coatings with good edge covering having a viscosity of 200 to 700 m Pas at 25° C. and comprising a solution of a photosensitive, lacquer-forming substance, wherein the photosensitive substance is a photosensitive epoxide resin having free curable epoxide groups, admixed with a curing agent or admixed with a curing agent and a curing accelerator, which is further characterised in that there are uniformly dispersed in the solution from 5 to 50% by weight, relative to the photosensitive substance, of a finely divided filler, and that the photosensitive substance is additionally thermally curable.

16. A process for producing protective masks by applying a thin layer of a coating composition as defined in claim 1 to a printed circuit board by the curtain coating method, subsequently drying and irradiating the layer image-wise while the soldered junctions are being left blank, developing the non-irradiated areas of the layer with a solvent and then curing.

4,544,624

PHOTOSENSITIVE RESIN COMPOSITION

Masaru Nanpei, Mie; Akira Tomita, Shiga; Toshiaki Fujimura, Shiga, and Kuniomi Etoh, Shiga, all of Japan, assignors to Toyo Boseki Kabnushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 466,675, Feb. 15, 1983, abandoned. This application Jan. 2, 1985, Ser. No. 688,402

Claims priority, application Japan, Feb. 15, 1982, 57-23266

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—281 **6 Claims**

1. A photosensitive resin composition consisting essentially of a soluble synthetic linear high-molecular compound in an amount of 25 to 95 wt % based on the whole composition, a monomer having at least one photopolymerizable unsaturated bond and a photopolymerization initiator and characterized in that the soluble synthetic linear high-molecular compound is selected from; (a) an addition polymer of an organic diisocyanate compound with an amide compound, both terminals of said amide compound being primary and/or secondary amino groups and wherein the equivalent ratio of amino groups to isocyanate groups in the addition polymer is not less than 1.0; or (b) said addition polymer in combination with another polymer which is selected from the group consisting of polyamides, polyesters, polyureas, polyurethanes and vinyl plylmers which may be homopolylmers or coplymers, random and block, or a mixtures of the polymers, and the content of said other polymer being not more than 50% by weight based on the total amount of the polymer material.

4,544,625

PHOTOSENSITIVE RESIN COMPOSITION AND PHOTOSENSITIVE ELEMENT

Toshiaki Ishimaru; Katsushige Tsukada, and Nobuyuki Hayashi, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 308,023, Oct. 2, 1981, abandoned. This application Feb. 3, 1984, Ser. No. 576,717

Claims priority, application Japan, Oct. 8, 1980, 55-141682

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—284 **18 Claims**

1. A photosensitive resin composition for forming a solder mask comprising

(a) 20 to 75 parts by weight of an urethane diacrylate or urethane dimethacrylate compound that has a molecular weight of 600 or less and that is obtained by reacting,

(i) trimethylhexamethylene diisocyanate and

(ii) an acrylic or methacrylic monoester of a dihydric alcohol which has 1 to 8 carbon atoms,

(b) 20 to 75 parts by weight of a linear polymeric compound having a glass transition temperature of about 40° to 150° C.,

(c) a sensitizer and/or a sensitizer system which generate free radicals owing to actinic light in an amount of 0.5 to 10% by weight based on the total weight of the urethane diacrylate or urethane dimethacrylate compound (a) and the linear polymeric compound (b), and

(d) an acrylic or methacrylic ester containing a phosphoric acid group in the molecule represented by the formula:

wherein R_3 is an organic group containing an acryloyl or methacryloyl group; and R_4 is hydrogen or an organic group containing an alkyl group or an acryloyl or methacryloyl group, in an amount of 0.01 to 5% by weight based on the total weight of the urethane diacrylate or urethane dimethacrylate compound (a) and the linear polymeric compound (b).

4,544,626

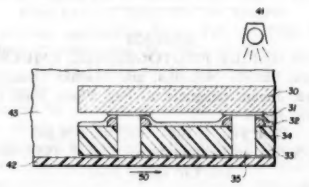
PHOTOPRINTING PROCESS AND APPARATUS FOR EXPOSING PHOTOPOLYMERS

Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Continuation-in-part of Ser. No. 147,726, May 8, 1980,. This application Sep. 23, 1983, Ser. No. 535,294

Int. Cl.⁴ G03C *5/16*

U.S. Cl. 430—311 **14 Claims**



1. The process of radiating the surface of a photopolymer layer through a phototool comprised of a thin flexible substrate carrying an image having an inner surface disposed toward the photopolymer and an outer surface disposed toward a radiation source to expose portions of the photopolymer layer corresponding to said phototool image with enough radiation to produce a change of photopolymer solubility, wherein heat from the radiation is dissipated to prevent undesirable distortion of said thin flexible phototool substrate by the heat and temperature rise, comprising the steps of excluding gas and air from the surface of the photopolymer layer to reduce the amount of radiation necessitated to change the photopolymer solubility by means of covering the photopolymer surface during radiation with a removable non-gaseous body transparent to said radiation, and dissipating heat generated by the radiation in the photopolymer layer and the thin flexible phototool during the exposure by disposing water in thermal contact with the photopolymer layer and disposing water on the outer surface of the phototool to thermally dissipate heat from that surface during radiation.

8. The process of claim 1 including the step of putting a substrate carrying said layer of photopolymer into a liquid

holding vessel under the surface of a liquid and passing the vessel past a radiation source at a movement rate permitting exposure of the photopolymer layer.

10. The process of claim 8 wherein the substrate comprises a printed wiring board.

4,544,627

NEGATIVE IMAGE FORMING PROCESS IN O-QUINONE DIAZIDE LAYER UTILIZING LASER BEAM

Yonosuke Takahashi; Hiromichi Tachikawa; Fumiaki Shinozaki, and Tomoaki Ikeda, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 300,822, Sep. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 089,846, Oct. 31, 1979, abandoned. This application Nov. 3, 1983, Ser. No. 548,132

Claims priority, application Japan, Oct. 31, 1978, 53-134270

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.⁴ G03F *7/26*

U.S. Cl. 430—325 **6 Claims**

1. A negative-working image forming process which comprises uniformly exposing a photosensitive material comprising a support having thereon a sensitive layer comprising an admixture of (i) an O-quinonediazide compound and (ii) a second compound selected from the group consisting of diazo dyes, anthraquinone dyes, quinoneimine dyes, methine dyes, copper phthalocyanine dyes and dyes having amino groups, alkylamino groups or hydroxyl groups as an auxochrome, to actinic radiation which is able to convert the o-quinonediazide compound to the corresponding indenecarboxylic acid compound, and subsequent to said uniformly exposing imagewise exposing said exposed photosensitive material to a laser beam to thereby render the indenecarboxylic acid compound of the imagewise exposed areas converted to the corresponding indene compound and developing with an alkaline developing solution to dissolve out the unexposed area to the laser beam, wherein said second compound reduces the rate of dissolution of the laser exposed areas in the developing solution by converting the indenecarboxylic acid to the corresponding indene compound, whereby said image results.

4,544,628

SILVER HALIDE PHOTOGRAPHIC EMULSION

Yuji Mihara; Satoshi Nagaoka, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 2, 1984, Ser. No. 576,249

Claims priority, application Japan, Feb. 2, 1983, 58-15929

Int. Cl.⁴ G03C *1/02*

U.S. Cl. 430—572 **17 Claims**

1. A silver halide photographic emulsion, comprising:

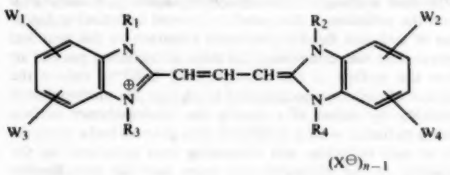
a binder having dispersed therein:

silver halide grains;

a sensitizing dye represented by general formula (I); and

a compound represented by general formula (II):

(I)



$(X^{\ominus})_{n-1}$

wherein:

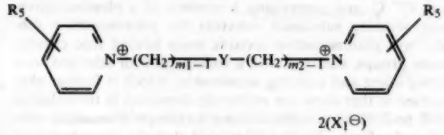
W_1, W_2, W_3 and W_4, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a cyano group, a trifluromethyl group or a hydroxy group;

R_1, R_2, R_3 and R_4, which may be the same or different, each represents an unsubstituted or substituted alkyl group; an unsubstituted or substituted cycloalkyl group or an unsubstituted or substituted alkenyl group, provided that at least one of R_3 and R_4 represents a substituted alkyl, cycloalkyl or alkenyl group containing a sulfo group or a carboxy group;

X represents an acid anion;

n represents 1 or 2;

(II)



$2(X_1^{\ominus})$

wherein:

R_5 represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxycarbonyl group, an acyloxy group, an alkoxy group, an amino group, a substituted amino group, an acylamido group or a carbamoyl group;

Y represents an alkylene group, an arylene group, an aralkylene group, —COO— or —COO—Y_1—OCO— where Y_1 represents an alkylene group, an arylene group or an aralkylene group;

X_1 represents an anion;

m_1 and m_2 each represents an integer of from 1 to 19.

4,544,629

RECEPTOR-BASED HISTAMINE ASSAY

Thomas K. Rice, White Bear Lake, and Therese A. Senta, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 19, 1982, Ser. No. 443,155

Int. Cl.⁴ G01N *33/54;* **C12Q** *1/42, 1/28, 5/02, 9/96*

U.S. Cl. 435—7 **16 Claims**

1. A method for determining the amount of histamine in a liquid test sample using histamine receptors and a histamine-indicator conjugate comprising the steps of:

a. contacting a measured amount of said test sample with an excess of substantially Purified histamine receptors which are free in solution or bound to a continuous solid phase support,

b. incubating and reacting said test sample with said histamine receptors, which reaction leaves unbound histamine receptors available for further bonding,

c. contacting an amount of histamine-indicator conjugate with the bound and unbound histamine receptors sufficient to bind said conjugate to all unbound histamine receptors,

d. incubating and reacting said histamine-indicator conjugate with said unbound histamine receptors,

e. removing unbound histamine-indicator conjugate if necessary to measure the amount of histamine-indicator conjugate bound to said histamine receptors,

f. measuring the amount of histamine-indicator conjugate bound to the histamine receptors, and

g. determining the amount of histamine in said test sample by comparison with standard curves,

with the proviso that

said histamine-indicator conjugate maintains its activity or undergoes stimulation of activity when bound to said histamine receptors, and

said method being capable of measuring at least 0.05 ng of histamine in a test sample.

4,544,630
PROCESS FOR SPECIFIC DETERMINATION OF CHOLESTEROL IN THE PRESENCE OF THE HDL FRACTION IN SERUM

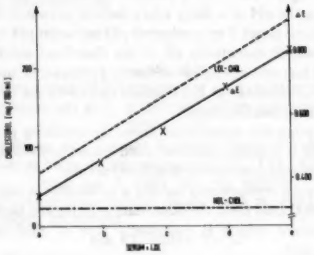
Joachim Ziegenhorn, Starnberg; Albert Röder, Seeshaupt; Knut Bartl, Wilzhofen, and Gunter Wehmeyer, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,792

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208253

Int. Cl.⁴ C12Q *1/60, 1/44*

U.S. Cl. 435—11 **15 Claims**



1. A process for specific determination of cholesterol present in the LDL serum fraction, in the presence of an HDL fraction of serum lipoproteins, comprising:

(a) adding a serum sample to cholesterol esterase;

(b) oxidizing cholesterol thus produced with cholesterol oxidase and oxygen, so as to form hydrogen peroxide and cholestenone, and

(c) measuring kinetically the concentration of one of the components of (b), wherein said measurement is carried out in a predetermined period of time, so as to provide data allowing elimination of cholesterol background contributed by said HDL fraction.

4,544,631
PROCESS AND REAGENT FOR THE DETERMINATION OF α-AMYLASE

Elli Rauscher, Munich; Ulrich Neumann, Peissenberg; August W. Wahlefeld, Weilheim; Alexander Hagen, Tutzing; Wolfgang Grüber, Tutzing-Unterzeismering; Joachim Ziegenhorn, Unterpfaffenhofen; Eugen Schaich, Weilheim; Ulfert Deneke, Peissenberg; Gerhard Michal, and Günter Weimann, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

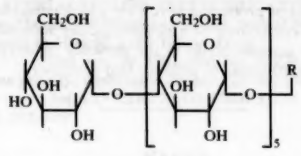
Continuation of Ser. No. 941,934, Sep. 11, 1978, abandoned. This application Oct. 16, 1981, Ser. No. 311,856

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741192; Dec. 14, 1977, 2755803

Int. Cl.⁴ C12Q *1/54, 1/48, 1/40, 1/34, 1/32*

U.S. Cl. 435—14 **19 Claims**

1. In a process for the determination of alpha-amylase by the enzymatic splitting of an alpha-amylase substrate and measurement of a fission product, the improvement comprising using, as a substrate, an enzymatically produced maltoheptaose compound of the formula



(I)

in which

R is a phenylglucoside, mononitrophenyl-glucoside, dinitrophenylglucoside, and wherein the sugar moiety of the R radical is substituted in the alpha-configuration,

in combination with alpha-glucosidase.

4,544,632
HUMAN T CELL LINES AND METHOD OF PRODUCING SAME

Yuichi Yamamura, 9/22, Nigawatakadai 1-chome, Takarazuka-shi, Hyogo-ken, and Tadamitsu Kishimoto, 5-31, Nakano 3-chome, Tondabayashi-shi, Osaka-fu, both of Japan

Filed Jun. 2, 1982, Ser. No. 384,427

Claims priority, application Japan, Jun. 12, 1981, 56-91265; Aug. 4, 1981, 56-122815

Int. Cl.⁴ C12P *21/00;* **C12N** *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—68 **12 Claims**

2. A human T hybrid cell line which is formed by fusing the cell line of HGPRT deficient human T leukemic cell having the identifying characteristics of ATCC number CRL-8081 with normal human T cells.

4,544,633
PROCESS FOR PRODUCING VITAMIN B_{12} BY THE FERMENTATION TECHNIQUE, AND VITAMIN B_{12}-PRODUCING MICROORGANISM

Ichiro Kojima, Yokosuka; Kouji Komiya, Yokohama; Hiroshi Sato, Kawasaki, and Yutaka Oguchi, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 468,996

Claims priority, application Japan, Feb. 26, 1982, 57-29064; Feb. 26, 1982, 57-29065; Feb. 26, 1982, 57-29066

Int. Cl.⁴ C12P *19/42;* **C12N** *1/20*

U.S. Cl. 435—86 **12 Claims**

1. A process for producing vitamin B_{12} by a fermentation technique, which comprises cultivating a vitamin B_{12}-producing microorganism belonging to the genus Propionibacterium in a culture medium containing a carbon source and a nitrogen source, and collecting vitamin B_{12} accumulated in cells of the microorganism, wherein

(1) the cultivation is carried out while adding an alkali at suitable times to the cultivation system so that during the cultivation, the cultivation system is maintained at a pH in the range of about 5 to about 7.5, and

(2) the cultivation is carried out while adding a carbon source portionwise to the cultivation system nearly at the same time as the addition of the alkali, the amount of the added carbon source being about 50 g to about 300 g per gram of the added alkali.

10. A propionic acid-resistant, vitamin B_{12}-producing microorganism of the genus Propionibacterium.

4,544,634
METHOD OF PRODUCING ACYCLOVIR

Thomas A. Krenitsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Oct. 14, 1982, Ser. No. 434,384

Int. Cl.⁴ C12P *17/18;* **A01N** *43/90;* **A61K** *31/52*

U.S. Cl. 435—119 **9 Claims**

1. A method of producing acyclovir which comprises converting 6-deoxyacyclovir or a physiologically acceptable salt

thereof in an aqueous liquid in the presence of oxygen and xanthine oxidase to produce said acyclovir.

7. A method of producing acyclovir which comprises converting 6-deoxyacyclovir or a physiologically acceptable salt thereof in an aqueous liquid in the presence of oxygen and xanthine dehydrogenase to produce said acyclovir.

4,544,635

PREPARATION OF OPTICALLY ACTIVE CIS-1,3-DIBENZYL-HEXAHYDRO-1H-FURO[3,4-d]IMIDAZOLE-2,4-DIONE AND ITS INTERMEDIATES

Naohito Ohashi, Hyogo; Kozo Shimago, Osaka; Takaharu Ikeda, Osaka, and Kikuo Ishizumi, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

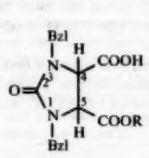
Division of Ser. No. 460,797, Jan. 25, 1983, Pat. No. 4,496,739. This application Feb. 13, 1984, Ser. No. 579,602

Claims priority, application Japan, Jan. 27, 1982, 57-12132; Apr. 28, 1982, 57-71834; Apr. 28, 1982, 57-71837; Apr. 30, 1982, 57-73938

Int. Cl.⁴ C12P *17/10;* **C07D** *491/048*

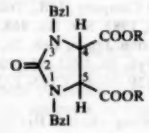
U.S. Cl. 435—121 **17 Claims**

1. A process for preparing an optically active cis-imidazolidinedicarboxylic acid monoester of the formula:



(III)

wherein R is a C_1–C_6 alkyl group, Bzl represents a benzyl group and the 4- and 5-positions take the 4S,5R-configuration, which comprises hydrolyzing a cis-imidazolidinedicarboxylic acid diester of the formula:



(II)

wherein R and Bzl are each as defined above with an enzymatic material having a capability of hydrolyzing the ester group in the said diester.

4,544,636

STARTER CULTURES OF IMPROVED ACTIVITY FOR DAIRY PRODUCTS AND PROCESS OF MAKING SAME

Robert R. Bily, Box 3637, San Jose, Calif. 95156

Continuation-in-part of Ser. No. 507,928, Jun. 27, 1983, abandoned. This application Sep. 16, 1983, Ser. No. 532,673

Int. Cl.⁴ C12N *1/20, 1/38;* **C12P** *7/56;* **A23C** *9/13*

U.S. Cl. 435—253 **5 Claims**

1. The method of making a lactic food product utilizing bacterial cultures and culture media comprising preparing said cultures and culture media by combining acid producing bacteria with sterile carrier media by and by further combining at least 0.01% lecithin by weight of the carrier media with said carrier media subsequently incubating the mixture of carrier media, acid producing bacteria and lecithin to produce an active, viable starter culture of enhanced activity and adding a small amount of said starter culture to a lactic medium and fermenting the mixture to produce a food.

4,544,637

CULTURE MEDIA FROM CLARIFIED DIARY WHEY LACTOSE PERMEATES

Kathleen M. Keggins, Glen Burnie; Ann C. Davis, College Park; Edward M. Sybert, Ellicott City; Thomas D. Mays, Burtonsville, and Robert A. Milch, Baltimore, all of Md., assignors to IGI Biotechnology, Inc., Columbia, Md.

Filed Sep. 14, 1982, Ser. No. 418,067

Int. Cl.⁴ C12N *1/20, 1/00*

U.S. Cl. 435—253 **17 Claims**

1. A dry powder microbiological culture medium which can be reconstituted with water and autoclaved to form a clear, pH neutral culture medium capable of supporting the growth of microorganisms under suitable growth conditions, said culture medium being prepared by a process consisting essentially of:

(a) raising the pH of a dairy whey lactose permeate having a pH below about 7 to a selected pH between pH 8 and pH 10 at which essentially all of the dissolved solids which would become insoluble when the permeate is autoclaved for 10–20 minutes at 121 degrees C. and 15 psi precipitate as microcrystalline solids;

(b) separating the supernatant from the resulting precipitate to form a microcrystalline solid phase consisting essentially of said previously dissolved solids;

(c) removing components having a molecular weight above about 100 kdal from the supernatant to form a lactose-rich supernatant which is essentially free of said dissolved solids; and

(d) drying the resultant supernatant to form said dry powder microbiological culture medium.

4,544,638

SYNTHESIS OF CROSS-LINKS IN THE HELICAL DOMAIN OF COLLAGEN USING PYRIDOXAL 5-PHOSPHATE AND COPPER OR IRON

Robert C. Siegel, Hillsborough, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 18, 1984, Ser. No. 611,909

Int. Cl.⁴ C07G *7/00;* **C08H** *1/06;* **C08L** *89/06;* **C09H** *7/00*

U.S. Cl. 435—273 **18 Claims**

1. An in vitro method for increasing the resistance to degradation of a proteolytic enzyme treated and purified collagen product comprising incubating said proteolytic enzyme treated collagen product with pyridoxal 5-phosphate and an ionic metal selected from the group consisting of copper and iron.

17. A collagen product consisting essentially of the central helical portion of native collagen and having cross-links of the native type produced by incubating reaction mixture consisting essentially of said collagen with pyridoxal-5-phosphate and either cupric copper ion or ferrous iron ion.

4,544,639

PROCESS FOR DETERMINING THE AMOUNT OF ORGANIC PHOSPHONATE PRESENT IN AN AQUEOUS SOLUTION

Robert J. Faust, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,033

Int. Cl.⁴ G01N *21/75*

U.S. Cl. 436—104 **6 Claims**

1. A process for determining the amount of organic phosphonate present in an aqueous solution, comprising the steps of:

(a) adding 1000 to 20,000 ppm of a strong oxidizing agent and 8 ppb to 5000 ppm silver ion as a reaction catalyst to the aqueous solution;

(b) allowing the organic phosphonate present in said solution to react at room temperature to form orthophosphate;

(c) precipitating any excess silver in said solution by the addition of 1000 to 50,000 ppm of a reducing agent or at least an equimolar amount of sodium chloride, based on

the silver ion added in Step (a), and removing any precipitate formed;

(d) adding to said solution 5 to 30 percent, by volume, of an acid solution containing 500 to 2000 ppm of ions selected from the group consisting of molybdate ion and vanadate ion, and if sodium chloride is used in Step (c), adding 1000 to 50,000 ppm of a reducing agent;

(e) measuring the absorbance of said solution at 625 to 880 nanometers and determining the orthophosphate concentration from a calibration curve of orthophosphate concentration versus absorbance; and

(f) subtracting any orthophosphate present in the original aqueous solution from the orthophosphate concentration determined in Step (e), to give the total organic phosphonate concentration.

4,544,640

ANTI IMMUNE COMPLEX ANTIBODY FOR DETERMINING SLE, RHEUMATOID ARTHRITIS OR TETANUS

Kazunori Soma, and Yasushi Kasahara, both of Tokyo, Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,766

Claims priority, application Japan, Apr. 9, 1982, 57-58274; Nov. 29, 1982, 57-207658

Int. Cl.⁴ G01N *33/54*

U.S. Cl. 436—506 **22 Claims**

1. An anti-immune complex antibody, which is a glycoprotein having a molecular weight of from 150,000 to 180,000, as determined by gel filtration, reacts with an immune complex in a blood serum of a human patient having systemic lupus erythematosus, rheumatoid arthritis or tetanus, and which does not react with aggregated IgG.

22. A method of determining an immune complex in the blood serum of a patient with systemic lupus erythematosus, chronic articular rheumatism, or tetanus toxoid, comprising contacting the respective antibody of claim 1 with said blood serum to thereby react the immune complex with said antibody.

4,544,641

REFRACTORY PRODUCTS FORMED BY GRAINS BOUND BY CARBON RESIDUES AND METAL SILICON IN POWDER FORM AND PROCESS FOR THE PRODUCTION THEREOF

Daniel Dumas, Saint Priest; Bruno du Mesnildot, Lyons, and Christian Michel, Sainte-foy-les-Lyon, all of France, assignors to Societe des Electrodes et Refractaires Savoie (SERS), Courbevoie, France

PCT No. PCT/FR83/00243, § 371 Date Jul. 10, 1984, § 102(e) Date Jul. 10, 1984, PCT Pub. No. WO84/02335, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 6, 1983, Ser. No. 629,547

Claims priority, application France, Dec. 8, 1982, 82 20893

Int. Cl.⁴ C04B *35/52, 35/56*

U.S. Cl. 501—87 **20 Claims**

1. A fired refractory product based on refractory grains and binder consisting essentially of:

a charge of refractory grains selected from the group consisting of carbonaceous products refractory hard metal compounds, refractory oxides and mixtures thereof, and

securing together said grains, a cement based on coked carbonaceous product and metal silicon in powder form, the proportion of metal silicon being from 1 to 15.8% by weight.

9. A refractory product according to claim 1, wherein said carbonaceous products are selected from the group consisting of anthracite, natural graphite, artificial graphite, amorphous carbon, coke and mixtures thereof.

4,544,642

SILICON CARBIDE ELECTRICAL INSULATOR MATERIAL OF LOW DIELECTRIC CONSTANT

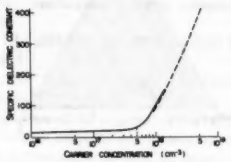
Kunihiro Maeda, and Tadahiko Miyoshi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

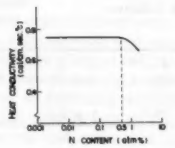
Filed Apr. 29, 1982, Ser. No. 373,261

Claims priority, application Japan, Apr. 30, 1981, 56-64152

Int. Cl.⁴ C22C *29/00*; C04B *35/56*

U.S. Cl. 501—88 **11 Claims**





1. A silicon carbide electrical insulator material of low dielectric constant consisting essentially of an electrically insulating sintered body which consists essentially of 0.1 to 3.5 weight % of Be as an element providing electrical insulating properties, 0.005 to 0.5 mol % of at least one element selected from the group consisting of Nb, V, Ta, N, P, As, Sb and Pi, and a balance of silicon carbide, whereby the carrier concentration within the crystal grain of silicon carbide in said sintered body is not more than 5×10^{17} cm^{-3} and said sintered body has electrical resistivity of not less than 10^7 Ω·cm at room temperature.

4,544,643

REFRACTORY FUSED CHROME-ALUMINA BRICKS AND COMPOSITIONS MADE FROM A GRANULAR FUSED MATERIAL AND PROCESSES FOR THEIR PRODUCTION

Teresa M. Fraser, Murrysville, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 11, 1984, Ser. No. 619,510

Int. Cl.⁴ C04B *35/10, 35/12*

U.S. Cl. 501—127 **6 Claims**

1. A refractory composition consisting of from 45 through 85 weight percent chromic oxide, and 15 through 55 weight percent alumina, said composition consisting of a fused coarse grain fraction of −4 mesh and a fine grain fraction of −325 mesh forming a bonding matrix, said fine grain fraction comprising 40 through 100 weight percent chromic oxide.

4,544,644

HIGH DIELECTRIC CONSTANT TYPE CERAMIC COMPOSITION

Youhachi Yamashita, Yokohama; Takashi Takahashi, Tokyo, and Mituo Harata, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 26, 1984, Ser. No. 593,119

Claims priority, application Japan, Mar. 31, 1983, 58-53785

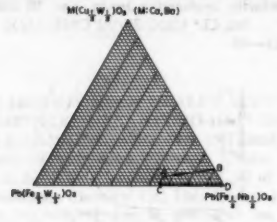
Int. Cl.⁴ C04B *35/00*

U.S. Cl. 501—134 **4 Claims**

1. A ceramic composition having a high dielectric constant consisting essentially of lead oxide, iron oxide, niobium oxide, tungsten oxide, copper oxide, and at least one of barium oxide

and calcium oxide, said ceramic composition being represented by the formula:

$$xPb(Fe_{\frac{1}{2}}Nb_{\frac{1}{2}})O_3\text{-}yM(Cu_{\frac{1}{3}}W_{\frac{1}{3}})O_3\text{-}zPb(Fe_{\frac{1}{2}}W_{\frac{1}{2}})O_3$$



wherein M is at least one of Ba and Ca, and wherein x, y and z are defined as follows:

[A:]	x = 65,	y = 5,	z = 30, or
[B:]	x = 90,	y = 10,	z = 0, or
[C:]	x = 65,	y = 0.5,	z = 34.5, or
[D:]	x = 99.5,	y = 0.5,	z = 0

4,544,645

PROMOTER FOR THE OXIDATION OF SO_2 IN AN FCC PROCESS

Alan W. Klaassen, El Cerrito, and Richard D. Bezman, Richmond, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 407,850, Aug. 13, 1982, Pat. No. 4,427,536, which is a continuation-in-part of Ser. No. 344,915, Feb. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 296,619, Aug. 27, 1981, abandoned. This application Sep. 19, 1983, Ser. No. 514,713

Int. Cl.⁴ B01J *29/12*

U.S. Cl. 502—66 **8 Claims**

8. A composition of matter useful for cracking a sulfur-containing hydrocarbon in the absence of added hydrogen which comprises:

(a) a particulate cracking catalyst consisting essentially of a silica-containing cracking catalyst impregnated with an aluminum compound capable of sorbing sulfur oxides; and

(b) a second particulate solid other than said particulate cracking catalyst comprising an inorganic oxide support associated with palladium or a compound of palladium and at least one other metal or a compound thereof selected from the group consisting of platinum, osmium, iridium, rhenium, and rhodium.

4,544,646

OLEFIN POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates, and Raymond E. Hoff, Palatine, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

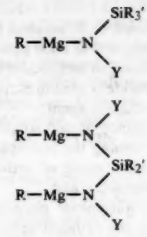
Filed Mar. 16, 1984, Ser. No. 590,157

Int. Cl.⁴ C08F *4/64, 4/68, 4/70, 4/62*

U.S. Cl. 502—109 **28 Claims**

15. The method of making an olefin polymerization and interpolymerization catalyst, comprising the step of reacting:

(a) at least one magnesium silylamide compound represented by the formulas:



(I)

(II)

in which R is a straight or branched chain hydrocarbyl group comprising alkyl groups of about 1–18 carbon atoms and aryl groups of about 6 to 14 carbon atoms, and the R groups are the same or different, R' is R or hydrogen, Y is R or —SiR'_3, all R' are the same or different, and all Y are the same or different, with

(b) a compound of a transition metal selected from Groups IIIB, IVB, VB and VIB of the fourth and fifth periods of the periodic table, and Groups VIIB and VIIIB of the fourth period.

20. The method of claim **15** wherein said silylamide, said transition metal compound or both is deposited on or reacted with a finely divided support prior to said reaction.

21. The method of claim **20** wherein said support comprises a difficult to reduce material comprising silica, alumina, zirconia, thoria, titania, magnesia, an organic polymer or mixtures thereof.

4,544,647

CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, ORGANIC HYDROXYL-CONTAINING COMPOUND, REDUCING HALIDE SOURCE AND TRANSITION METAL COMPOUND

Ricardo Fuentes, Jr., and Calvin P. Esneault, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 403,252, Jul. 29, 1982, abandoned. This application Mar. 6, 1984, Ser. No. 586,577

Int. Cl.⁴ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—115 **5 Claims**

1. A catalytic product resulting from admixing in an inert hydrocarbon diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium material;

(B) at least one alcoholic organic hydroxyl-containing material;

(C) at least one reducing halide source; and

(D) at least one transition metal (Tm) compound; and wherein

(1) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C); and

(2) the components are employed in quantities so as to provide the following atomic ratios

Mg:Tm of from about 0.1:1 to about 100:1;

Cl:Mg of from about 3:1 to about 20:1; and

component B is present in a quantity such that for every magnesium and aluminum atom present in component (A) there remains on the average no more than about 0.75 hydrocarbon groups attached to a magnesium atom and an aluminum atom combined.

2. A catalytic product of claim **1** wherein

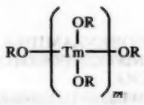
(1) Component (A) is represented by the formula $R_2Mg.xMeR'_{x'}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; each R' is independently a hydrogen, hydrocarbyl group having from 1 to about 20 carbon atoms; Me is Al or Zn; x has a value from zero to 10 and is sufficient to render the or-

ganomagnesium component hydrocarbon soluble; and x' has a value equal to the valence of Me;

(2) Component (B) is represented by the formula ROH wherein each R is a hydrocarbyl group having from 1 to about 20 carbon atoms; and

(3) component (C) is represented by the formula $Al(R^3)_{3-m}X_m$ including mixtures thereof wherein each R^3 is independently hydrogen or a hydrocarbyl group as above defined, and m has a value from 1 to 2;

(4) component (D) is represented by the formula TmY_nX_{z-n}, or



wherein Tm is titanium in its highest stable valence state; Y is oxygen or OR''; R is a hydrocarbyl group having from 1 to about 20 carbon atoms; R'' is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen; z has a value corresponding to the valence of the transition metal, Tm; m has a value of from 1 to about 20; n has a value of from zero to 4 with the value of z−n being from zero up to a value equal to the valence state of the transition metal, Tm;

(5) the atomic ratio of Mg:Tm is from about 1:1 to about 40:1; and

(6) the atomic ratio of Cl:Mg is from about 6:1 to about 20:1.

4,544,648

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Takeshi Nomura; Kouji Maruyama; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 615,015

Claims priority, application Japan, May 31, 1983, 58-94895

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—119 **10 Claims**

1. A catalyst component for use in the polymerization of olefins which is obtained by contacting a magnesium compound represented by the formula Mg(OR)(OR'), a halogenated hydrocarbon selected from the group consisting of mono or polyhalogen substituted compounds of saturated or unsaturated aliphatic, alicyclic or aromatic hydrocarbons, a halogenated silane represented by the formula R''_mSiX_{4-m} and a titanium compound, wherein R and R', which may be the same or different, are alkyl, alkenyl, cycloalkyl, aryl and aralkyl groups, R'' is hydrogen or a hydrocarbon group containing from 1 to about 10 carbon atoms, X is a halogen atom and m is 0, 1, 2 or 3.

4,544,649

CATALYSTS COMPRISING TANTALA SUPPORTED ON TITANIA

Israel Wachs, Bridgewater, and Claudio C. Chersich, Englewood Cliffs, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1984, Ser. No. 626,066

Int. Cl.[4] B01J *21/06, 23/20*

U.S. Cl. 502—350 **5 Claims**

1. A catalyst composition comprising an oxide of tantalum supported on titania wherein at least a portion of the supported tantalum metal oxide is in a non-crystalline form.

4,544,650

PROCESS FOR MANUFACTURING HYDROPHOBIC ADSORBENTS

Reiner Kinder, Leipzig; Johannes Teubel, Freiberg; Herbert Schuster, and Christine Fanslau, both of Leipzig, all of German Democratic Rep., assignors to Institut For Energetik Zentralstelle Fur Rationelle Energieanwendung, Leipzig, German Democratic Rep.

Filed May 29, 1984, Ser. No. 614,919

Claims priority, application German Democratic Rep., May 27, 1983, 251338

Int. Cl.[4] B01J *20/08, 20/20;* **C01B** *31/12*

U.S. Cl. 502—424 **6 Claims**

1. A process for manufacturing a hydrophobic adsorbent, comprising the steps of:

(a) mixing fly ash and an organic constituent selected from the group which consists of bituminous material, rubber, fatty acids and residues thereof, molasses and waste sulfite liquor residue to form a mixture of solid inorganic and organic constituents;

(b) dehydrating said organic constituents in said mixture by combining zinc chloride with said mass and heating said mass to a temperature of about 600° C. in a nonoxidizing atmosphere and maintaining said temperature for a period of time sufficient to carbonize said organic constituents and transform said mixture into an activated mass; and

(c) thereafter heating said mass to a higher temperature between substantially 900° C. and 1150° C. and maintaining said mass at said higher temperature for a postcarbonization period sufficient to consolidate said mass.

4. The process defined in claim 1 wherein the amount of said organic constituent in said mixture in terms of the carbonization residue thereof is equal to at most about 50% by weight of the amount of said fly ash, and the amount of the zinc chloride added in said mixture equals at most about 100% by weight of said carbonization residue.

5. The process defined in claim 1 wherein said organic constituent is combined with the zinc chloride prior to the addition of the fly ash to form the mixture.

4,544,651

S-2-(CARBOALKOXYVINYL) TRITHIOPHOSPHONATE INSECTICIDES

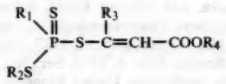
Charles G. Chavdarian, Martinez, and William G. Haag, Pleasant Hill, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 16, 1984, Ser. No. 600,660

Int. Cl.[4] C07F *9/40;* **A01N** *57/21*

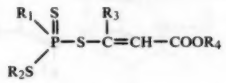
U.S. Cl. 514—120 **16 Claims**

1. A compound having the formula



in which R_1 is methyl or ethyl; R_2 is a straight or branched chain alkyl group having from 3 to 5 carbon atoms; R_3 is hydrogen, methyl or carbomethoxy; and R_4 is an alkyl group having from 1 to 4 carbon atoms.

12. A method for controlling insects comprising applying to said insect or a locus at which control is desired an insecticidally effective amount of a compound having the formula



in which R_1 is methyl or ethyl; R_2 is a straight or branched chain alkyl group having from 3 to 5 carbon atoms; R_3 is

hydrogen, methyl or carbomethoxy; and R_4 is an alkyl group having from 1 to 4 carbon atoms.

4,544,652

α-HYDROXYETHYLPHOSPHINATES, AND THEIR USE AS FUNGICIDES

Mitsuru Sasaki, Osaka, and Yukio Ishiguri, Hyogo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

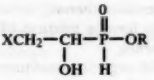
Filed Apr. 22, 1983, Ser. No. 487,670

Claims priority, application Japan, Apr. 26, 1982, 57-71072; Jun. 8, 1982, 57-98982; Dec. 1, 1982, 57-211815

Int. Cl.⁴ A01N *57/20, 57/22;* **C07F** *9/40*

U.S. Cl. 514—127 **4 Claims**

1. A compound of the formula:



wherein X is a hydrogen atom, a chlorine atom or a bromine atom and R is an alkyl group, a lower haloalkyl group, a lower cycloalkyl group, a lower alkoxy(lower)alkyl group, a lower alkylthio(lower)alkyl group, a phenoxy(lower)alkyl group, a phenylthio(lower)alkyl group, a phenyl(lower)alkoxy(lower-)alkyl group, a phenyl(lower)alkylthio(lower)alkyl group, a lower cycloalkyl(lower)alkyl group, a lower alkyl(lower)cycloalkyl group, a halo(lower)cycloalkyl group, a lower alkylthio(lower)cycloalkyl group, a lower alkoxy(lower)cycloalkyl group, a lower cycloalkyl(lower)cycloalkyl group, a lower alkoxy(lower)alkoxy(lower)alkyl group, a phenyl(lower)alkyl group, a halophenyl(lower)alkyl group, a lower alkylphenyl(-lower)alkyl group, a lower alkoxyphenyl(lower)alkyl group, a phenoxyphenyl(lower)alkyl group, a phenylphenyl(lower)alkyl group, a dihalophenyl(lower)alkyl group, a di(lower)alkylphenyl(lower)alkyl group, a di(lower)alkoxyphenyl(lower)alkyl group, a tri(lower)alkoxyphenyl(lower)alkyl group, a naphthyl(lower)alkyl group or an anthracenyl(lower)alkyl group.

4. A fungicidal composition which comprises as an active ingredient a fungicidally effective amount of the compound according to claim 1 and an inert carrier or diluent.

4,544,653

SYN-ISOMER OF 3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Sakai; Takashi Masugi, Toyonaka; Hisashi Takasugi, Osaka, and Hiromu Kochi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 767,700, Feb. 11, 1977, Pat. No. 4,166,115.

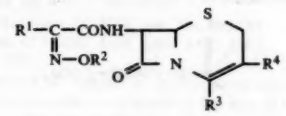
This application Mar. 6, 1978, Ser. No. 883,395

Claims priority, application United Kingdom, Apr. 12, 1976, 14916/76; Jun. 7, 1976, 23490/76; Japan, Oct. 19, 1976, 51-125826

Int. Cl.⁴ A61K *31/545;* **C07D** *501/24*

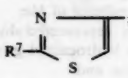
U.S. Cl. 514—202 **13 Claims**

1. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds of the formula:



and pharmaceutically acceptable salts thereof, in which

R^1 is



R^2 is lower alkyl;

R^3 is carboxy;

R^4 is carbamoyloxymethyl which may be substituted with a trihalo(lower)alkanoyl; and

R^7 is amino, lower alkanoylamino or halo(lower)alkanoylamino.

4,544,654

SUBSTITUTED SULFONAMIDOBENZAMIDES, ANTIARRHYTHMIC AGENTS AND COMPOSITIONS THEREOF

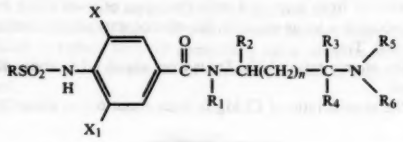
David D. Davey, Succasunna, N.J.; William C. Lumma, Jr., Pennsburg, Pa., and Ronald A. Wohl, Morris Plains, N.J., assignors to Schering A.G., Berlin, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,649

Int. Cl.⁴ A61K *31/18, 31/535;* **C07C** *143/75, 143/80*

U.S. Cl. 514—210 **28 Claims**

1. A compound according to the formula:



wherein

R = lower alkyl, cycloalkyl, cycloalkyl(lower)alkyl, benzyl, or benzyl substituted by halogen, loweralkyl, loweralkoxy, or lower alkyl substituted by hydroxy, lower alkoxy, carbamoyl, N-loweralkylcarbamoyl, N,N-diloweralkylcarbamoyl and sulfamoyl;

X, X_1 = hydrogen and halogen;

R_1 = hydrogen, loweralkyl, unsaturated loweralkyl, loweralkoxyloweralkyl, or collectively with R_2 is an alkylene chain forming an azetidine, pyrrolidine, piperidine, or hexahydroazepine ring, or collectively with R_3 is a bond or an alkylene chain forming an azetidine, pyrrolidine, piperidine or a hexahydroazepine ring, or collectively with R_5 may produce a piperazine or a hexahydro-1,4-diazepine ring system;

R_2 = hydrogen, loweralkyl or collectively with R_3 is a bond or an alkylene chain to form a saturated carbocyclic ring of from 4 to 8 ring carbon atoms.

R_3, R_4 = hydrogen, loweralkyl or collectively is an alkylene chain forming a saturated carbocyclic ring of from 4 to 6 ring carbon atoms;

R_5, R_6 = unsaturated loweralkyl, C_1–C_{12} straight or branched chain alkyl, C_3–C_6 cycloalkyl, cycloalkyl(lower)alkyl, or when taken together form a saturated heterocyclic ring of from 4 to 8 ring members which may be substituted by one or more methyl groups or optionally contains a —O—, or

linkage wherein p is the integer 0, 1 or 2;

R_6 = loweralkyl substituted by phenyl which may be substituted by up to 3 substituents selected from hydroxy or methoxy groups;

n = 0, 1, 2;

and the pharmaceutically acceptable salts thereof; with the proviso that:

(a) when any of R_1, R_5 or R_6 is unsaturated loweralkyl, the unsaturation cannot be alpha to the nitrogen atom.

27. The method of treating arrhythmias in a mammalian subject in need thereof comprising administering to said subject an antiarrhythmically effective dose of a compound according to claim 1.

4,544,655

ANTIINFLAMMATORY, ANALGESIC, AND ANTIRHEUMATIC 4-HYDROXY-2-METHYL-N-(2-PYRIDYL)-6-TRIFLUOROMETHYL-2H-THIENO[2,3-E]-1,2-THIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE, CORRESPONDING COMPOSITIONS, AND 3-CARBOXYLIC ACID LOWER ALKYL ESTER INTERMEDIATES

Rudolf Pfister, Basel; Paul Zeller, Allschwil, both of Switzerland; Dieter Binder, and Otto Hromatka, both of Vienna, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

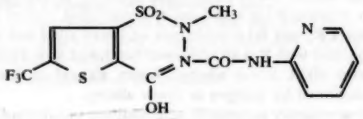
Filed Aug. 31, 1983, Ser. No. 528,341

Claims priority, application Switzerland, Sep. 9, 1982, 5377/82

Int. Cl.[4] **C07D** *513/04;* **A61K** *31/54*

U.S. Cl. 514—222 **5 Claims**

1. 4-Hydroxy-2-methyl-3-(2-pyridylcarbamoyl)-6-trifluoromethyl-2H-thieno[2,3-e]-1,2-thiazine 1,1-dioxide of the formula



I

or a pharmaceutically acceptable salt thereof.

4,544,656

PHARMACEUTICAL COMPOSITION AND METHOD OF TREATING PSORIASIS

Donncha O'Sullivan, 6 Greenfield Crescent, Donnybrook, Dublin 4, Ireland

Filed May 23, 1983, Ser. No. 497,207

Claims priority, application Ireland, Aug. 17, 1982, 1981/82

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.[4] **A61K** *31/185*

U.S. Cl. 514—228 **18 Claims**

1. A method of treating psoriasis which comprises applying to an affected area of skin a therapeutically effective amount of at least one skin-compatible zwitterionic aminosulfonic acid (one ZASA) having the formula

$$RNR'SO_3H$$

wherein R represents tris-(hydroxymethyl)-methyl or the combination RN represents a radical selected from the group consisting of N-piperazinyl, N-morpholinyl, and N-[N'-(2-hydroxyethyl)]-piperazinyl; and R' is a C_{2-4} straight or branched chain alkylene radical.

4,544,657

SUBSTITUTED ISOQUINOLINES

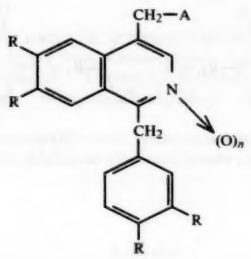
Hans Bruderer, Biel-Benken, Switzerland; Richard W. Kierstead, North Caldwell; John G. Mullin, Jr., Hawthorne, both of N.J.; Keiji Nakamura, Kamakura; Mitsuru Tateishi, Atsugi, both of Japan; Teitel Sidney, Clifton, and Jay P. O'Brien, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 19, 1983, Ser. No. 496,327

Int. Cl.[4] **A61K** *31/47, 31/495;* **C07D** *401/06*

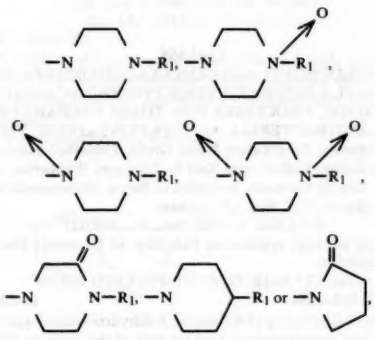
U.S. Cl. 514—253 **11 Claims**

1. A compound of the formula



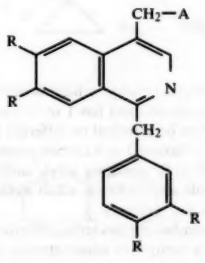
I

wherein n is the integer zero or 1, R is lower alkoxy, and A is



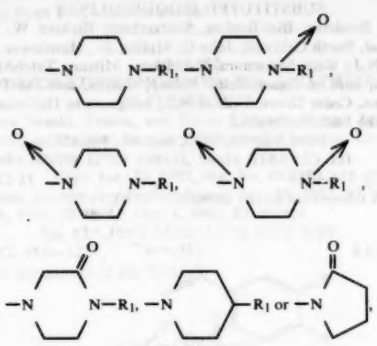
wherein R_1 is phenyl, halophenyl, lower-alkylphenyl or lower-alkoxyphenyl, or a pharmaceutically acceptable acid addition salt thereof.

10. A method of treating cerebral and cardiac ischemias which comprises administering an effective amount of a compound of the formula



I

wherein R is lower alkoxy, and A is



wherein R_1 is phenyl, halophenyl, lower-alkylphenyl or lower-alkoxyphenyl, or a pharmaceutically acceptable acid addition salt thereof.

4,544,658

1-CYCLOPROPYL-6-FLUORO-1,4-DIHYDRO-4-OXO-7-(ALKYL-1-PIPERAZINYL)QUINOLINE-3-CARBOXYLIC ACIDS, PROCESSES FOR THEIR PREPARATION AND ANTIBACTERIAL AGENTS CONTAINING THEM

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

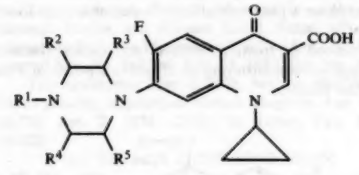
Filed Dec. 9, 1983, Ser. No. 560,027

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248506

Int. Cl.[4] A61K *31/47, 31/495;* **C07D** *401/04*

U.S. Cl. 514—254 **16 Claims**

1. A 1-Cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-(alkyl-1-piperazinyl)quinoline-3-carboxylic acid of the formula (I)



(I)

in which

R^1 represents hydrogen or alkyl which is optionally substituted by 1 to 2 hydroxyl and has 1 to 12 carbon atoms,

R^2, R^3, R^4 and R^5 can be identical or different and represent hydrogen or alkyl having 1 to 4 carbon atoms, at least one of the radicals R^2 to R^5 denoting alkyl, and their pharmaceutically utilisable acid addition, alkali metal and alkaline earth metal salts and hydrates.

14. A method of combatting bacterial infection in a warm-blooded animal which comprises administering to said animal an antibacterially effective amount of an active compound of claim **1** in admixture with an inert pharmaceutical carrier.

4,544,659

SCHISTOSOMICIDAL ACRIDANONE HYDRAZONES

Urs Brombacher, Riehen; Marc Montavon, Basel, both of Switzerland; Hermann Bretschneider; Joachim Schantl, both of Innsbruck, Austria, and Wolfgang Türk, Ludwigshafen am Rhein, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

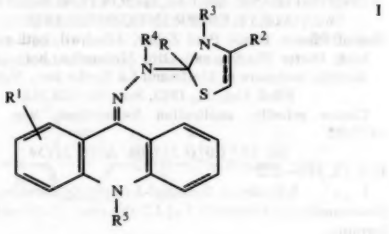
Filed Nov. 15, 1983, Ser. No. 551,816

Claims priority, application Switzerland, Nov. 26, 1982, 6895/82

Int. Cl.[4] A61K *31/47;* **C07D** *219/08*

U.S. Cl. 514—297 **18 Claims**

1. A compound of the formula

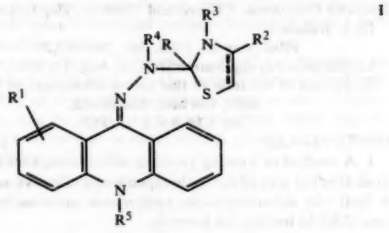


I

wherein the dotted line is an optional bond. R^1 is hydrogen, halogen or nitro, R^2 is hydrogen or lower alkyl, one of the substituents R^3 and R^4 is hydrogen or lower alkyl and the other together with R is an additional bond, and R^5 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl or lower alkyl substituted by halogen or lower alkoxy,

or a pharmaceutically acceptable acid addition salt thereof.

11. A method of treating or preventing schistosomiasis which comprises administering to a mammalian host an effective amount of a compound of the formula



I

wherein the dotted line is an optional bond, R^1 is hydrogen, halogen or nitro, R^2 is hydrogen or lower alkyl, one of the substituents R^3 and R^4 is hydrogen or lower alkyl and the other together with R is an additional bond, and R^5 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl or lower alkyl substituted by halogen or lower alkoxy,

or a pharmaceutically acceptable acid addition salt thereof.

4,544,660

PHARMACEUTICALLY ACTIVE TROPANES

Michael S. Hadley, Sawbridgeworth, and Francis D. King, Newport, both of England, assignors to Beecham Group p.l.c., England

Continuation-in-part of Ser. No. 107,413, Dec. 26, 1979, Pat. No. 4,273,778. This application Jun. 9, 1981, Ser. No. 271,990

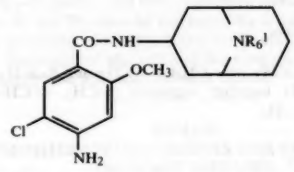
Claims priority, application United Kingdom, Dec. 30, 1978, 50380/78; Mar. 15, 1979, 7909262; Aug. 9, 1979, 7927831

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.[4] C07D *451/02;* A61K *31/445*

U.S. Cl. 514—329 **24 Claims**

1. A compound of formula (IX) or a pharmaceutically acceptable salt thereof:



(IX)

wherein R_6^1 is C_{1-4} alkyl.

4,544,661

FUNGICIDAL N-PYRIDYLOXY ALKYL AMINES

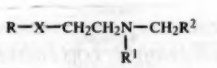
David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 23, 1983, Ser. No. 535,176

Int. Cl.[4] C07D *213/64, 213/65;* A01N *43/40*

U.S. Cl. 514—345 **20 Claims**

1. A compound of the formula:



wherein X is sulfur or oxygen; R is pyridyl optionally substituted with 1 to 3 substituents independently selected from halogen, lower alkyl or lower alkoxy optionally substituted with 1 to 3 of the same or different halogen atoms or nitro; R^1 is lower alkyl; and R^2 is phenyl or substituted phenyl substituted with 1 to 3 substituents independently selected from halogen trihalomethyl, lower alkyl or lower alkoxy, and compatible salts thereof.

9. A method of controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of claim **1**.

4,544,662

1'-SUBSTITUTED-SPIRO[OXAZOLIDINE-5-3'-INDOLINE]-2,2', 4-TRIONE DERIVATIVES

David R. Brittain, Macclesfield, and Robin Wood, Stockport, both of United Kingdom, assignors to Imperial Chemical Industries, England

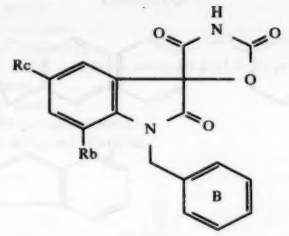
Filed May 6, 1983, Ser. No. 492,246

Claims priority, application United Kingdom, May 7, 1982, 8213206

Int. Cl.[4] C07D *498/10, 263/44;* A61K *31/42*

U.S. Cl. 514—374 **5 Claims**

1. A 1'-substituted-spiro[oxazolidine-5,3'-indoline]-2,2',4-trione of the formula:



wherein Rb is methyl; Rc is hydrogen or chloro; and benzene ring B is selected from 4-bromophenyl, 3,4-dibromophenyl, 3,4-dichlorophenyl, 3-bromo-4-chlorophenyl, 4-bromo-3-chlorophenyl, 4-bromo-2-fluorophenyl and 2-fluoro-4-iodophenyl.

4,544,663

INDOLAMINE DERIVATIVES AS ANTI-FERTILITY AGENTS

Robert E. Manning, Mt. Lakes, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

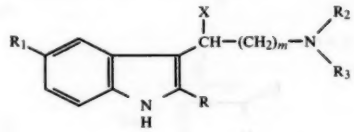
Filed May 7, 1984, Ser. No. 607,667

Int. Cl.[4] A61K *31/40, 31/42*

U.S. Cl. 514—378 **21 Claims**

1. A method of inducing aspermatogenesis in male mammals requiring anti-fertility treatment which comprises administering to the mammal an anti-fertility therapeutically effective amount of

(a) a compound of the formula:



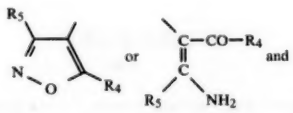
(1)

where

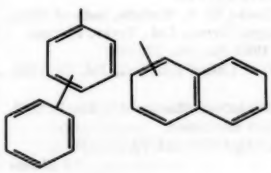
m is an integer from 1 to 4

X represents hydrogen or —OH

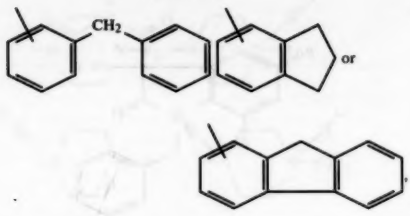
R represents Ar,



Ar represents

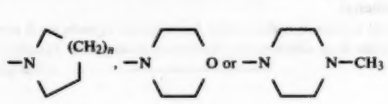


-continued



R_1 represents hydrogen, fluoro, chloro, lower alkyl or lower alkoxy,

R_2 and R_3 each, independently, represent lower alkyl, or R_2 and R_3 together with N represent



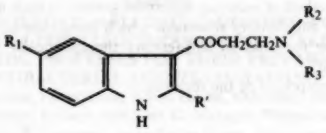
wherein

n is 1, 2 or 3,

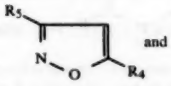
R_4 represents hydrogen or lower alkyl, and

R_5 represents hydrogen or lower alkyl, unsubstituted phenyl or phenyl mono- or di-substituted with fluoro, chloro, lower alkyl or lower alkoxy, or

(b) a compound of the formula:



where R′ is Ar or



Ar, R_1, R_2, R_3, R_4 and R_5 are as defined above, or a pharmaceutically acceptable acid addition salt thereof.

4,544,664

ANTIHYPERTENSIVE SUBSTITUTED IMIDAZOLE DERIVATIVES

Arto J. Karjalainen, and Kauko O. A. Kurkela, both of Oulu, Finland, assignors to Farmos Group, Ltd., Turku, Finland

Filed Jul. 7, 1982, Ser. No. 396,000

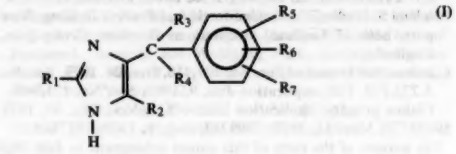
Claims priority, application United Kingdom, Jul. 10, 1981, 8121333

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.[4] **A61K** *31/415;* **C07D** *233/56, 233/64*

U.S. Cl. 514—396 **12 Claims**

1. A substituted imidazole of the formula:



(I)

or a non-toxic pharmaceutically acceptable addition salt thereof, wherein R_1 is H, alkyl of 1 to 4 carbon atoms or $—CH_2OH$; R_2 is H or $—CH_3$; R_3 is $—CH_3$, $—CH_2CH_3$, $—CH_2CH_2CH_3$,

$—CH_2CH_2CH_2CH_3$, or $—CH_2CH=CH_2$, and R_4 is H or OH; or R_3 and R_4 together represent $=CH_2$, $=CH—CH_3$, $=CH—CH_2—CH_3$,

or $=CH—CH_2CH_2CH_2CH_3$; R_5 R_6 and R_7 which can be the same or different are H, $—CH_3$, $—CH_2CH_3$, halogen, OH or $—OCH_3$, at least one of R_5, R_6 and R_7 being other than hydrogen, or R_5 is hydrogen and R_6 and R_7 together form an $—O—CH_2—O—$bridge between two adjacent carbon atoms in the phenyl group.

12. A method of producing an anti-hypertensive effect in a subject in whom such an effect is desired which comprises administering thereto an amount effective as an antihypertensive agent of a substituted imidazole as defined in claim 1 or of a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,544,665

1-ARYL-3-AZABICYCLO[3.2.0]HEPTANES

Joseph W. Epstein, Monroe, N.Y.; Thomas C. McKenzie, Tuscaloosa, Ala., and William J. Fanshawe, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

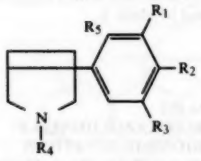
Filed Nov. 21, 1983, Ser. No. 553,676

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.[4] **C07D** *209/52;* **A61K** *31/40*

U.S. Cl. 514—412 **16 Claims**

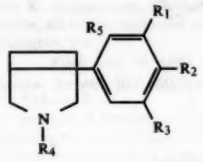
1. Compounds, including optically active isomers and racemic mixtures, represented by the formula:



wherein R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, hydroxy, chloro, fluoro, bromo, C_1–C_3 alkyl, C_1–C_3 alkoxy and trifluoromethyl and any two or more of R_1, R_2 and R_3 may be the same; R_4 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; and R_5 is hydrogen or alkoxy; and the non-toxic, pharmacologically acceptable acid-addition salts thereof.

9. A method of treating depression in a warm-blooded animal, which method comprises administering to said animal a

therapeutically effective amount of a compound, including optically active isomers and racemic mixtures, represented by the formula:



wherein R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, hydroxy, chloro, fluoro, bromo, C_1–C_3 alkyl, C_1–C_3 alkoxy, and trifluoromethyl, and any two or more of R_1, R_2 and R_3 may be the same; R_4 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; and R_5 can be either hydrogen or alkoxyl; and the nontoxic pharmacologically acceptable acid-addition salts thereof.

4,544,666

CHEMOTHERAPEUTIC AGENTS FOR THE CONTROL OF PLANT DISEASES

Mandayam J. Thirumalachar; Mandayam J. Narasimhan, and Mandayam J. K. Thirumalachar, all of Bangalore, India, assignors to Phyton/AG, Inc., Minneapolis, Minn.

Filed Apr. 22, 1983, Ser. No. 487,842

Int. Cl.[4] **A01N** *37/10;* **A61K** *31/235, 31/24;* **C07C** *101/12*

U.S. Cl. 514—460 **6 Claims**

1. As a new chemotherapeutic agent, the tannate complex of picro ammonium formate wherein for each 100 parts by dry weight of ammonium formate said complex includes from about 2 to 5 parts by weight of picric acid and about 0.5 to 2 parts by weight of tannic acid combined with about 2 to 10 parts by weight of surfactant sufficient to prevent formation of ammonium picrate.

4,544,667

2-SULFAMOYLBENZO[B]FURAN DERIVATIVES FOR THE TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

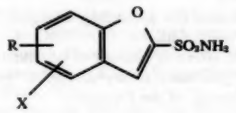
Kenneth L. Shepard, North Wales, and Samuel L. Graham, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 9, 1984, Ser. No. 578,463

Int. Cl.[4] **A61K** *31/34;* **C07D** *307/82*

U.S. Cl. 514—470 **18 Claims**

1. A compound of structural formula:



or an ophthalmologically or pharmaceutically acceptable salt thereof, wherein:

X is halogen, chloro, bromo or fluoro, C_{1-3}alkyl, hydroxy or C_{1-3}alkoxy; and

R is

(1) hydroxy,

(2) R_a^1 wherein R_a^1 is

(a) C_{1-18}alkyl either straight or branched chain and substituted with one or more of

(i) C_{3-6}cycloalkyl,

(ii) halo,

(iii) aryl, wherein the aryl group is phenyl, naphthyl, pyridinyl, furanyl, pyrazinyl, imidazolyl or thienyl and wherein the aryl group can be substituted with one or more of C_{1-10}alkyl, halo, C_{1-4}alkoxy or C_{2-5}alkanoyl,

(iv) hydroxy,

(v) C_{1-3}alkoxy,

(vi) aryl-C_{1-3}alkoxy, wherein aryl is as previously defined,

(vii) amino,

(viii) (C_{1-3}alkyl)amino,

(ix) di(C_{1-3}alkyl)amino

(x)

wherein R^2 is

(1) HO—,

(2) M^+O^-, wherein M^+ is a pharmaceutically acceptable cation,

(3) C_{1-10}alkoxy,

(4) R^3R^4N— wherein R^3 and R^4 are independently hydrogen, C_{1-15}alkyl, or taken together form a 3–7 membered heterocycle, selected from piperidino and pyrrolidino, with the nitrogen to which they are attached,

(b) C_{3-6}cycloalkyl,

(c) C_{1-18}alkyl-C_{3-6}cycloalkyl,

(d) aryl as previously defined,

(e) C_{2-6}alkenyl,

(f) aryl-C_{2-6}alkenyl, wherein aryl is as previously defined, or

(g) C_{2-6}alkynyl;

(3) R_a^1—O—,

(4)

wherein R^1 is R_a^1 or C_{1-18}alkyl,

(5)

(6)

(7)

wherein x is 0–2; y is 0–3; z is 0 or 1; and A is a heteroatom selected from S, O and N,

(8)

wherein R^5 and R^6 are independently:

(a) hydrogen,

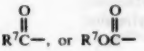
(b) C_{1-18}alkyl, either straight or branched chain,

(c) C_{3-6}cycloalkyl,

(d) C_{3-6}cycloalkyl-C_{1-3}alkyl,

(e) aryl-C_{1-3}alkyl wherein the aryl group is as previously defined and is either unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3}alkyl or C_{1-3}alkoxy,

(f)



wherein R^7 is

(i) C_{1-18}alkyl, either straight or branched chain,

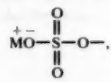
(ii) aryl as previously defined, either unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3}alkyl, or C_{1-3}alkoxy,

(iii) aryl-C_{1-3}alkyl wherein the aryl group is as previously defined and is either unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3}alkyl or C_{1-3}alkoxy,

(iv) amino-C_{1-18}alkyl either straight or branched chain; or

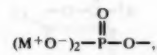
(g) R^5 and R^6 if lower alkyl, are joined together directly or through a heteroatom selected from O or N to form a 5 or 6 membered heterocycle with the nitrogen to which they are attached selected from pyrrolidine, piperidine, morpholine and piperazine;

(9)



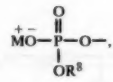
wherein M^+ is an ophthalmologically acceptable cation selected from sodium, potassium, ammonium, tetra(C_{1-4}alkyl)ammonium, pyridinium, imidazolium, pralidoxime, and thiamine

(10)



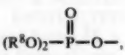
wherein M^+ is as previously defined;

(11)



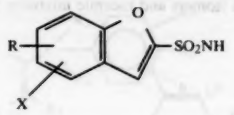
wherein R^8 is C_{1-3}alkyl or phenyl-C_{1-3}alkyl; or

(12)



wherein R^8 is as previously defined, and the two may be the same or different.

13. A method of treating glaucoma and elevated intraocular pressure which comprises topical ocular application to a patient in need of such treatment of an effective intraocular pressure lowering amount of a compound with structural formula:



or an ophthalmologically acceptable salt thereof, wherein R and X are as defined in claim **1**.

4,544,668

COMPOUNDS AND COMPOSITIONS USEFUL FOR PRODUCING ANALGESIA

John M. Janusz, Fairfield, Ohio; Brian L. Buckwalter, Yardley, Pa., and Thomas R. LaHann, Cleves, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

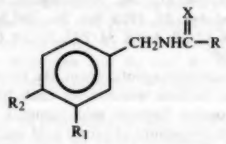
Filed Jul. 14, 1983, Ser. No. 514,205

Int. Cl.[4] **A01N** *37/02, 37/06, 37/18;* **A61K** *31/165*

U.S. Cl. 514—563 **15 Claims**

5. A composition for producing analgesia in humans or lower animals, comprising:

(a) a safe and effective amount of a methylenealkanamide compound or pharmaceutically-acceptable salt thereof, or mixtures thereof, of the formula:



wherein X is O or S, R is straight or branched, methylene-substituted alkane having from 11 to 23 carbon atoms, R_1 is H, OH, or OCH_3, R_2 is OH or a chort-chain ester, and wherein at least one of R_1 and R_2 is OH or OCH_3; and

(b) a pharmaceutically-acceptable carrier.

4,544,669

COMPOUNDS AND COMPOSITIONS USEFUL FOR PRODUCING ANALGESIA

Thomas R. LaHann, Cleves; John M. Janusz, Fairfield, both of Ohio, and Brian L. Buckwalter, Yardley, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio

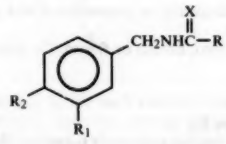
Filed Jul. 14, 1983, Ser. No. 514,207

Int. Cl.[4] **A01N** *37/02, 37/06, 37/18;* **A61K** *31/165*

U.S. Cl. 514—563 **22 Claims**

7. A composition for producing analgesia in humans or lower animals, comprising:

(a) a safe and effective amount of an alkadienamide compound or pharmaceutically-acceptable salt thereof, or mixtures thereof, of the formula:



wherein X is 0 or S, R is straight or branched diene having from 11 to 23 carbon atoms, R_1 is H, OH, or OCH_3, R_2 is OH or a short-chain ester, and wherein at least one of R_1 and R_2 is OH or OCH_3; and

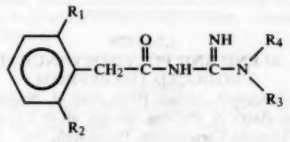
(b) a pharmaceutically-acceptable carrier.

4,544,670
METHOD OF TREATING COCCIDIOSIS WITH ACYL GUANIDINES

William L. Studt, Harleysville; Stuart A. Dodson, Lansdale; Harry K. Zimmerman, Kintnersville, and James L. Barnes, Glenside, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Aug. 24, 1982, Ser. No. 410,958
Int. Cl.[4] A01N *33/02, 37/30*
U.S. Cl. 514—617 5 Claims

1. A method of treating coccidiosis in poultry comprising administering to poultry infected with coccidiosis a therapeutically effective amount of a compound of the formula



wherein:

R_1 and R_2 are hydrogen, halo, lower alkoxy, trihalomethyl, and at least one of R_1 and R_2 are halo or trihalomethyl;

R_3 is hydrogen or methyl; and

R_4 is lower alkyl; or a pharmaceutically acceptable salt thereof.

4,544,671
PROCESS FOR PREPARING HIGH SURFACE AREA IRON/COBALT FISCHER-TROPSCH SLURRY CATALYSTS

Stuart L. Soled, Madison, and Rocco A. Fiato, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,192
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—700 23 Claims

1. A slurry process for synthesizing a hydrocarbon mixture containing C_2–C_{20} olefins comprising the step of contacting a catalyst composition, comprised of an unsupported iron-cobalt spinel, said spinel exhibiting a single phase being isostructural with Fe_3O_4 as determined by powder X-ray diffractometry, and possessing an initial BET surface area greater than 5 m^2/g and an Fe:Co atomic ratio of 7:1 and above, with a mixture of CO and hydrogen under conditions of pressure, space velocity, and elevated temperature, for a time sufficient to produce said C_2–C_{20} olefins.

4,544,672
COBALT-PROMOTED CATALYSTS FOR USE IN FISCHER-TROPSCH SLURRY PROCESS

Rocco A. Fiato, Scotch Plains, and Stuart L. Soled, Madison, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,191
Int. Cl.[4] C07L *1/04*
U.S. Cl. 518—700 23 Claims

1. A slurry process for synthesizing a hydrocarbon mixture containing C_2–C_4 olefins comprising the step of contacting a liquid slurry catalyst system, comprised of a slurry liquid and a carbided and reduced, unsupported iron-cobalt single phase spinel catalyst containing a Group IA or IIA metal salt promoter agent, and said spinel having the initial empirical formula:

$$Fe_xCo_yO_4$$

wherein x and y are integer or decimal values, other than zero, with the provisos that the sum of x + y is 3 and the ratio of x/y is 7:1 or above, said spinel exhibiting a single phase X-ray diffraction pattern substantially isostructural with that of Fe_3O_4 and said spinel having a measured BET surface area of up to 5 m^2/g, said process being conducted with a mixture of CO and hydrogen under conditions of pressure, space velocity, and elevated temperature, for a time sufficient to produce said product C_2–C_4 olefins.

4,544,673
PROCESS FOR PRODUCING LOW MOLECULAR WEIGHT HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

Michael F. Lemanski, Cleveland, and Wayne R. Kliewer, North Randall, both of Ohio, assignors to Standard Oil Company, Ohio

Division of Ser. No. 440,120, Nov. 8, 1982, Pat. No. 4,451,579.
This application Mar. 30, 1984, Ser. No. 585,746
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—713 10 Claims

1. A process for producing low molecular weight hydrocarbons at elevated temperatures and pressures comprising contacting carbon monoxide and hydrogen with a catalyst represented by the formula:

$$[Cu_{0.1\text{-}3}(Z)]_{0.1\text{-}3}M_{0.1\text{-}3}A_{0.01\text{-}2}O_x$$

wherein

Z is tungstate;

M is selected from the group consisting of thorium and uranium;

A is at least one element selected from the group consisting of the alkali and alkaline earth metals; and

x is a number which satisfies the valence requirements of the other elements present.

4,544,674
COBALT-PROMOTED FISCHER-TROPSCH CATALYSTS

Rocco A. Fiato, Scotch Plains; Stuart L. Soled, Madison, and Angelo A. Montagna, Summit, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,193
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—717 15 Claims

1. A fixed bed process for synthesizing a hydrocarbon mixture containing C_2–C_6 olefins comprising the step of contacting a fixed bed of a catalyst composition comprised of an unsupported Group IA or IIA metal salt promoted iron-cobalt spinel: said spinel exhibiting a single spinel phase, being isostructural with Fe_3O_4 as determined by X-ray diffractometry and possessing a BET nitrogen surface area of up to 5 m^2/g, and an iron-cobalt atomic ratio of 7:1 or above; with a mixture of CO/hydrogen under process conditions of pressure, space velocity (SHSV) and elevated temperature for a time sufficient to produce said C_2–C_6 olefins.

4,544,675
RECLAIMING OF VULCANIZED RUBBER

Edward Anderson, Jr., North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 4, 1984, Ser. No. 616,744
Int. Cl.[4] C08J *11/04*
U.S. Cl. 521—43 2 Claims

1. In a process for reclaiming rubber in which a sulfur-vulcanized rubber is broken down in the presence of reclaiming oil, water vapor and aryl disulfide peptizer under a condition of elevated temperature in the range of about 175° C. to about 195° C. and at a pressure in the range of about 230 to about 260 psi over a period of about 1 to about 4 hours, wherein said aryl disulfide is obtained as a mixture of aryl disulfide containing volatile mercaptan dissolved therein, the improvement which comprises treating said mixture by distillation prior to its use in said reclaiming process to remove said volatile mercaptan; wherein said aryl disulfide mixture, prior to treatment by distil-

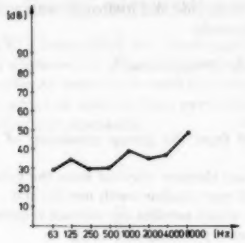
lation, contains about 2 to about 8 weight percent volatile mercaptan dissolved therein having a boiling point at atmospheric pressure in the range of about 65° C. to about 95° C.

4,544,676

SOUND-INSULATING LEATHER POWDER COMPOSITIONS

István Gyurkó; Csaba Czeininger; Károly Moskó, and Ferenc Nagy, all of Pécs, Hungary, assignors to Mecseki Szénbányák, Pécs, Hungary

Filed Apr. 13, 1984, Ser. No. 599,903
Claims priority, application Hungary, Apr. 20, 1983, 1365/83
Int. Cl.⁴ C08J *9/00*
U.S. Cl. 521—84.1 **10 Claims**



1. Sound- and heat-insulating microporous and/or macroporous composition, which comprises a finely dispersed leather powder whose elementary fibrils have a diameter of about 0.2 to 0.8 microns and are about 5 to 15 microns long of animal origins, a phenol-aldehyde resin or a urea formaldehyde resin, and a wetting and/or foaming agent and an acidic catalyst.

4,544,677

FOAMABLE POLYCARBONATE COMPOSITIONS, ARTICLES AND METHODS

Richard B. Allen, Dalton, and Roger W. Avakian, Pittsfield, both of Mass., assignors to General Electric Company, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,801
Int. Cl.⁴ C08J *9/10*
U.S. Cl. 521—91 **30 Claims**

1. A foamable thermoplastic composition comprising

(a) an aromatic polycarbonate, an aromatic polyester carbonate, an aromatic dihydric phenol sulfone carbonate, or a mixture of any of the foregoing, alone, or in combination with

(b) a saturated polyester resin comprising units of an aliphatic diol, a cycloaliphatic diol, or a mixture of said diols and an aromatic diacid or a cycloaliphatic diacid,

(c) a minor effective amount of a chemical foaming agent; and

(d) a minor effective amount of siliceous particulate foam nucleating agent which is coated with a siliceous compound to render that agent hydrophobic, alone, or combined with a particulate organic polymeric material, said nucleating agent being substantially insoluble in the composition and having an aspect ratio of not greater than about 1.0, the amounts of (c) and (d) being sufficient to provide a rigid substantially uniform cellular core within a solid integral skin.

4,544,678

FILLED OR EXTENDED POLYURETHANE FOAM CONTAINING POLYETHYLENE GLYCOL SOFTENING AGENT

Gerald Fesman, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 19, 1984, Ser. No. 672,523
Int. Cl.⁴ C08G *18/14*
U.S. Cl. 521—107 **13 Claims**

1. A foam formulation for preparing a filler-extended polyurethane foam having improved softness which comprises, as essential ingredients: polyether triol polyol, filler, isocyanate, water, and an effective amount for such enhanced softness of a liquid polyethylene glycol.

4,544,679

POLYOL BLEND AND POLYISOCYANURATE FOAM PRODUCED THEREFROM

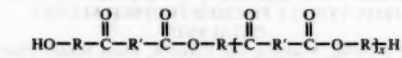
Richard B. Tideswell, Allison Park; Neil H. Nodelman, Pittsburgh, and Barry A. Phillips, Slovan, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1985, Ser. No. 703,849
Int. Cl.⁴ C08G *18/14, 18/30, 18/48, 18/79*
U.S. Cl. 521—116 **16 Claims**

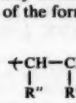
13. A polyisocyanurate/polyurethane foam prepared by reacting

(A) a polyol blend comprising:

(a) from about 20 to about 90 percent by weight of a polyester diol having an OH number of from about 50 to about 500 and having the structure:



wherein each R may be the same or different and represents a radical of the formula:



where R″ represents H or CH_3 with the proviso that both R″s cannot be CH_3, and y represents a number of from 1 to 5,

wherein R′ represents an aromatic radical having from 6 to 12 carbon atoms, and

wherein x represents a number of from 0 to 5,

(b) from about 2 to about 40 percent by weight of an organic compound containing from 3 to 8 hydroxyl groups and being selected from the group consisting of

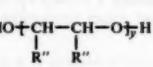
(i) compounds having OH numbers of from about 250 to about 1830 and being free of carboxylic acid ester groups,

(ii) compounds having OH numbers of from about 150 to about 1000 and containing at least one carboxylic acid ester group, and

(iii) mixtures thereof,

(c) from about 5 to about 30 percent by weight of a condensation product formed from 1 mole of a phenol and from 4 to 15 moles of ethylene oxide, and

(d) from 0 to about 40 percent by weight of at least one diol of the structure:



where R″ and y are as defined above, and

(B) a polyphenyl polymethylene polyisocyanate having a viscosity of from about 100 to about 2500 mPa.s at 25° C., in the presence of a catalyst and a blowing agent, the amounts

of components being such that the isocyanate index is from about 140 to about 500.

4,544,680

METHOD OF PREVENTING SCORCH IN A POLYURETHANE FOAM AND PRODUCT THEREOF

Barry A. Jacobs, Bethel, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 17, 1984, Ser. No. 682,520

Int. Cl.[4] C08G *18/14, 18/18*

U.S. Cl. 521—128 **12 Claims**

1. A method for stabilizing a flame retarded polyurethane foam composition against scorching which comprises incorporating in said foam composition an effective amount of an N-alkanoyl-N,N'-dialkylphenylenediamine compound for scorch inhibition.

4,544,681

FOAMABLE ORGANOSILOXANE COMPOSITIONS

Chi-Long Lee, and James A. Rabe, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 665,272, Oct. 26, 1984, Pat. No. 4,518,716. This application Mar. 4, 1985, Ser. No. 708,188

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—134 **8 Claims**

1. A cured polyorganosiloxane foam exhibiting a substantially closed cell structure, a maximum cell size of less than 4 mm and a minimum cell concentration of four per linear centimeter, said foam having been formed by dispensing a foamable polyorganosiloxane composition from a pressure resistant container into an area under atmospheric pressure and allowing the resultant product to cure in the presence of atmospheric moisture, where said foamable polyorganosiloxane composition exhibits a viscosity of from 0.5 to 500 Pa.s at 25° C. in the absence of a blowing agent is stable during storage under substantially anhydrous conditions and superatmospheric pressure, and comprises the product obtained by mixing in the absence of atmospheric moisture

(A) a room temperature vulcanizable elastomeric composition comprising the moisture curable product obtained by mixing

(1) an organosiloxane polymer curable in the presence of a moisture reactive crosslinker and selected from the group consisting of polydimethylsiloxanes and graft copolymers containing at least 20 mole percent of dimethylsiloxane units, any remaining units being derived from substantially linear addition or condensation type organic polymers, and

(2) an amount of a crosslinker sufficient to cure (1) in the presence of atmospheric moisture,

(B) A foam stabilizer in an amount sufficient to stabilize said foam during the curing process, where (B) consists essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{\frac{1}{2}}$ units and fluorine-containing units selected from the group consisting of $R_aR'_bSiO_{(4-a-b)/2}$, $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R' is an alkyl radical containing from 1 to 3 carbon atoms, R'' is a divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the two silicon atoms of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less, with the proviso that when R and R'' represent fluorine-containing units bonded to silicon via an oxygen atom the organosiloxane copolymer optionally contains repeating units of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxyl group per molecule and selected from the group consisting of polyethers, polyoxyalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than hydroxyl and $SiO_{4/2}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorine-containing units and any $GSiO_{3/2}$ units is sufficient to (a) impart a surface tension of less than 2.2×10^{-4} newtons per centimeter at 25° C. to a 10 percent by weight solution of (B) in a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of 0.08 Pa.s at 25° C. and (b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity;

(C) a blowing agent in an amount sufficient to convert said polyorganosiloxane composition to a foam under atmospheric pressure and at a temperature of 25° C.

4,544,682

POLYMERIC COMPOSITIONS POSSESSING IMPROVED FLAMMABILITY RESISTANCE

John M. Corbett, Newark, Ohio, and Fred W. Neumann, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1984, Ser. No. 643,945

Int. Cl.[4] C08F *14/00*

U.S. Cl. 521—142 **21 Claims**

1. A polymeric composition comprising a monoalkenyl aromatic polymer having polymerized therein from about 5 to about 25 mole percent, based on total monomer polymerized therein, of an unsaturated cyclic imide having appended, to the nitrogen atom, a bromine substituted aliphatic or aromatic substituted aliphatic hydrocarbon radical.

4,544,683

INORGANIC-ORGANIC FIXED-DRESSINGS AND A PROCESS FOR THEIR PRODUCTION

Peter Müller, Odenthal; Kuno Wagner, Leverkusen; Christian Wegner, Cologne, and Peter Schwabe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,792

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320217

Int. Cl.[4] C08K *3/30;* **A61F** *13/04;* **A61K** *6/02;* **C08L** *75/04*

U.S. Cl. 523—111 **14 Claims**

1. A process for producing an inorganic-organic fixed dressings based on gypsum and polyurethane comprising contacting a textile support carrying calcined gypsum or anhydrite with an aqueous dispersion of a polyurethane or polyurethane-urea which dispersion contains up to about 20% by weight (relative to the total mixture) of an alcohol and up to about 20% by weight (relative to the total mixture) of another organic solvent, each 100 grams of polyurethane or polyurethane-urea having about 0.1–130 milli-equivalents of ionic groups or of groups which can be converted into ionic groups, and allowing the composition to set while permitting any solvents which may be present to evaporate.

4,544,684

COMPOSITIONS BASED ON VINYLIDENE FLUORIDE POLYMERS INCORPORATING BORON CARBIDE

Joseph Dumoulin, Wezembeek-Oppem, and Jean-Marie De Berraly, Waterloo, both of Belgium, assignors to Solvay & Cie S.A., Brussels, Belgium

Filed Oct. 22, 1984, Ser. No. 663,186

Claims priority, application France, Oct. 28, 1983, 83 17442

Int. Cl.[4] G21F *1/10*; C08K *9/00, 3/38*

U.S. Cl. 523—136 10 Claims

1. Compositions based on vinylidene fluoride polymers incorporating boron carbide, characterised in that the boron carbide is coated with an acrylic polymer.

4,544,685

INSULATION JACKETING MATERIAL

Robert J. Hoelzer, Westfield, N.J., assignor to Manville Service Corporation, Denver, Colo.

Filed Oct. 10, 1984, Ser. No. 659,467

Int. Cl.[4] C08K *9/02, 3/02, 3/10, 5/58*

U.S. Cl. 523—200 10 Claims

1. A composition useful as an insulation jacketing material having excellent anti-smoke properties comprising the following ingredients:

(a) about 54–60 wt% polyvinyl chloride resin having an Inherent Viscosity of from about 0.70–1.09 as measured by ASTM D 1243;

(b) about 1.5–4 wt% of at least one heat stabilizer;

(c) about 0.5–4.5 wt% of at least one lubricant;

(d) about 6–8 wt% chlorinated polyethylene;

(e) about 8–10 wt% titanium dioxide;

(f) about 18–20.5 wt% of at least one compound selected from the group consisting of (i) ground aluminum hydroxide and (ii) ground magnesium hydroxide wherein said compound is surface treated with a fatty acid; and

(g) about 3–4 wt% molybdenum trioxide.

4,544,686

COATING COMPOSITIONS

Charles W. Bromley, Buckinghamshire; Brian A. Cooke, Surrey, and Norman A. Coombes, Berkshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 30, 1984, Ser. No. 615,274

Claims priority, application United Kingdom, Jun. 7, 1983, 8315609

Int. Cl.[4] C09D *3/58, 3/81, 5/02*

U.S. Cl. 523—411 14 Claims

1. A washcoat composition suitable for application to tin-plated mild steel, consisting of an aqueous carrier medium and a binder comprising

(A) from 70% to 98% by weight of a thermosetting acrylic polymer which is present as a sterically stabilised dispersion in the said aqueous medium, and

(B) from 2% to 30% by weight of an epoxy resin; and which additionally contains from 0.1% to 10% by weight, based on the total binder, of an acid catalyst.

4,544,687

HEAT-CURABLE SURFACE-COATING AGENTS, AND THEIR USE

Eberhard Schupp, Schwetzingen; Werner Loch, Erpolzheim; Rolf Osterloh, Gruenstadt, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 547,093

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311513

Int. Cl.[4] C08L *63/02*

U.S. Cl. 523—414 8 Claims

1. A heat-curable surface-coating agent which contains, as a binder, a mixture of (A) from 50 to 95% by weight of a polyadduct, polycondensate or other polymer which has an average molecular weight $\overline{M}_n$ of from 500 to 10,000 and, per molecule, on average two or more OH or NH groups or OH and NH groups and (B) from 5 to 50% by weight of a reaction product of a polyisocyanate and an olefinically unsaturated amine which carries a secondary amino group and a methacrylamide or methacrylate group.

4,544,688

METAL-CONTAINING PHENOLIC COATING COMPOSITIONS

George A. Salensky, Whitehouse Station, and John S. Fry, Hillsborough Township, Somerset County, both of N.J., assignors to Union Carbide Corp., Danbury, Conn.

Filed May 29, 1984, Ser. No. 614,800

Int. Cl.[4] C08K *3/26, 3/08*

U.S. Cl. 523—458 15 Claims

1. Coating composition expressed on a solvent free basis comprising:

(A) an organic binder consisting essentially of:

(1) about 4 to about 40 volume percent of a divalent metal complex of a para-substituted novolac phenol-aldehyde condensation product;

(2) about 60 to about 96 volume percent product of an organic coating material selected from the group consisting of alkyd resins, drying oils, epoxy resins and thermoplastic polyhydroxyethers; and

(B) based on the total coating composition, a pigment selected from the group consisting essentially of (i) aluminum-bronze lamellar pigments at a pigment volume concentration of about 7 to about 15 volume percent, (ii) about 20 to about 40 volume percent of a non-lamellar pigment selected from the group consisting of talc, titanium dioxide, zinc phosphate, calcium carbonate, manganese oxide and iron oxide, and (iii) about 50 to about 65 volume percent of particulate zinc metal.

4,544,689

AQUEOUS POLYVINYL ESTER DISPERSION, PROCESS FOR ITS MANUFACTURE, AND ITS USE

Werner Ehmann, Frankfurt am Main; Alfons Homanner, Sulzbach, and Helmut Rinno, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 15, 1983, Ser. No. 514,171

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226681

Int. Cl.[4] C08F *18/08, 2/44, 2/20*; C09J *3/14*

U.S. Cl. 524—52 13 Claims

1. An aqueous polyvinyl ester dispersion having a solid content of from 35 to 65 weight %,

from 3 to 60 weight % of dispersed particles of which has a diameter of below 1 μm and consists of from 95 to 100 weight % of polyvinyl acetate or a vinyl acetate copolymer and from 0 to 5 weight % of native starch,

from 40 to 97 weight % of dispersed particles of which has a diameter of from 1 to 40 μm and consists of from 20 to 95 weight % of polyvinyl acetate or a vinyl acetate copolymer and from 5 to 80 weight % of native starch, and

the dispersion contains from 3 to 12 weight %, relative to the total amount of dispersed particles, of polyvinyl alcohol.

4,544,690

AQUEOUS RUBBERIZED COAL TAR EMULSION

Douglas J. Ladish, Dover, Del., assignor to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,706

Int. Cl.[4] C08L *25/10, 95/00*

U.S. Cl. 524—60 34 Claims

1. An aqueous rubberized coal tar emulsion coating composition for application to a paved asphalt surface and the like consisting essentially of a standard coal tar emulsion containing about 40 to about 60 percent water based on the volume of

the coal tar emulsion and from about 1 to about 20 percent by volume of an acid copolymer latex emulsion based on the volume of the coal tar emulsion, wherein said copolymer contains at least about 50 percent by weight of a combination of butadiene and styrene, and up to about 20 percent by weight of at least one polymerizable ethylenically unsaturated carboxylic acid or mixtures thereof to form the acid copolymer latex, said acid copolymer latex emulsion having an average latex particle size of from about 400 to about 2000 Ångstroms, all moieties of the acid copolymer latex emulsion based on the weight of the copolymer, whereby said composition is characterized by a thixotropic nature.

34. An improved paved asphalt surface and the like, which is prepared by applying a thin coating of a thixotropic composition that consists essentially of a mixture of a standard coal tar emulsion containing about 40 to about 60 percent water based on the volume of the coal tar emulsion, from about 1 to about 12 percent by weight of a latex emulsion copolymer based on the volume of the coal tar emulsion, wherein said copolymer contains at least 50 percent by weight of a combination of butadiene and styrene, and up to about 20 percent by weight of at least one polymerizable ethylenically unsaturated monomer containing at least one carboxylic acid group or mixtures thereof to form the acid copolymer latex, said acid copolymer latex emulsion having an average latex particle size of from about 400 to about 2000 Ångstroms, all moieties of the copolymer based on the weight of the copolymer latex emulsion, and sand being present in the amount of between 0.5 to about 20 pounds per gallon of said conventional coal tar emulsion, the ratio of water to coal tar emulsion being about 1 to about 1, whereby said dried coating presents a hard durable surface on the surface of the paved asphalt.

4,544,691

COMPOSITIONS CONTAINING ULTRAVIOLET-ABSORBING STABILIZING SUBSTITUTED BY AN ALIPHATIC HYDROXYL GROUP

Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 318,648, Nov. 5, 1981, Pat. No. 4,414,393. This application Jun. 20, 1983, Ser. No. 505,648

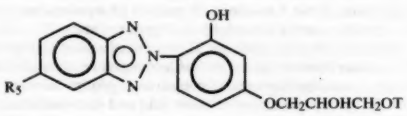
Int. Cl.[4] C08K *5/34;* **C08L** *33/08*

U.S. Cl. 524—99 **6 Claims**

1. A stabilized composition which comprises

(a) a polymer selected from the group consisting of polyesters, polycarbonates, polysulfones, polyurethanes, polyamides, thermoset acrylic resins, thermoplastic acrylic resins, polyolefins and alkyd resins, and

(b) 0.1 to 5% by weight of said polymer of a compound having the formula



where T is alkyl of 4 to 14 carbon atoms, and R_5 is hydrogen or chloro.

4,544,692

POLYSILOXANE AND FLUOROCARBON COATING COMPOSITION

Edmund J. Kuziemka, Naperville, Ill., assignor to Material Sciences Corporation, Mount Prospect, Ill.

Filed Aug. 29, 1983, Ser. No. 527,244

Int. Cl.[4] C08L *63/02, 27/08*

U.S. Cl. 524—361 **19 Claims**

1. A fast curing resin coating composition consisting essentially of:

an epoxy resin having a molecular weight measured by gel permeation chromatography in the range of from about 300 to about 200,000 present in the range of from about 10% by weight to about 20% by weight of said composition,

not less than about 85% of said epoxy resin having a molecular weight in the range of from about 50,000 to about 200,000,

an effective amount of a cross-linking agent for said epoxy resin,

a polysiloxane resin system present in the range of from about 2% by weight to about 7% by weight of said composition,

an effective amount of a curing agent for said polysiloxane resin system,

a fluorocarbon polymer present in the range of from about 4% by weight to about 15% by weight of said composition, and

the balance being suitable solvents.

4,544,693

WATER-SOLUBLE FILM

John M. Surgant, Clayton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1984, Ser. No. 567,586

Int. Cl.[4] C08K *5/06*

U.S. Cl. 524—375 **16 Claims**

1. A composition useful for forming water-soluble film comprising:

Component	% By Weight
a. Polyvinyl alcohol	40.0–75.0
b. Polyvinyl pyrrolidone	7.5–43.0
c. Ethoxylated alkyphenol surfactant	7.0–20.0
d. Polyhydric alcohol	7.0–20.0

4,544,694

EXTRUSION LUBRICANT COMPOSITION AND PROCESS

J. David Bower, Long Valley, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 453,381, Dec. 27, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 620,534

Int. Cl.[4] C08K *5/05, 5/04;* **C08L** *91/00*

U.S. Cl. 524—385 **15 Claims**

1. A composition of matter consisting essentially of a mixture of (i) from about 1 to about ninety parts by weight of one or more hydrocarbon waxes per 99 to 10 parts by weight of (ii) an additive which consists essentially of

(A) from about 30 to 80% by weight of a Group II or lead metal salt of an alkyl fatty acid having from 12 to 30 carbon atoms;

(B) from about 1 to 30% by weight of a fatty acid having from 12 to 30 carbon atoms; and

(C) from about 20 to 60% by weight of one or more polar substances selected from the group of fatty monoalcohols and glycerol monostearate.

4,544,695

LOW MELTING PHOSPHATE-SULFATE GLASSES AS INTUMESCENT FLAME AND/OR SMOKE RETARDANTS FOR POLYMERS

Ronald E. Myers, Strongsville, Ohio, assignor to The B. F. Goodrich Company, Arkon, Ohio

Filed Sep. 13, 1984, Ser. No. 649,874

Int. Cl.[4] C08K *3/30, 3/32;* **C08L** *27/06, 27/08*

U.S. Cl. 524—405 **12 Claims**

1. A flame and/or smoke retardant polymeric composition, comprising:

(a) a polymer selected from the group consisting of a rigid or plasticized polyvinylchloride, a polyvinylidene chloride, a polyolefin wherein said olefin is made from monomers having from 2 to 12 carbon atoms, a polychloroprene, a polyamide, a polyester, a polyurethane, polymers of acrylonitrile alone or with styrene, and combinations thereof, and

(b) from about 10 parts to about 100 parts by weight per 100 parts by weight of said polymer of a phosphate-sulfate low melting temperature glass composition having an average particle size of from about 0.1 micron to about 250 microns, the amount of phosphate glass component based upon the total amount of phosphate glass component and sulfate glass component in said glass composition being from about 18 to about 60 mole present and the amount of said sulfate glass component in said glass composition is from about 82 to about 40 mole percent of the total amount of phosphate glass component and sulfate glass component in said glass composition.

9. A phosphate-sulfate glass composition for imparting improved flame and/or smoke retardant properties to a polymer selected from the group consisting of a rigid or plasticized polyvinylchloride, a polyvinylidene chloride, a polyolefin wherein said olefin is made from monomers having from 2 to 12 carbon atoms, a polychloroprene, a polyamide, a polyester, a polyurethane, polymers of acrylonitrile alone or with styrene, and combinations thereof, said composition comprising from about 18 to about 60 mole percent of phosphate glass components and from about 82 to about 40 mole percent of sulfate glass components, said glass composition having an average particle size of from about 0.1 to about 250 microns.

4,544,696

SILICONE ELASTOMERS HAVING THERMALLY CONDUCTIVE PROPERTIES

Marie J. Streusand, Saline; John C. Getson, Adrian, and Richard C. McAfee, Tecumseh, all of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Oct. 29, 1984, Ser. No. 665,484
Int. Cl.[4] C08K *3/28*
U.S. Cl. 524—428 **17 Claims**

1. A thermally conductive organopolysiloxane composition comprising (a) an organopolysiloxane having an average of at least two aliphatically unsaturated hydrocarbon radicals per molecule, (b) an organohydrogenpolysiloxane having an average of at least two Si-bonded hydrogen atoms per molecule, (c) a catalyst capable of promoting the addition of the Si-bonded hydrogen atoms to the aliphatically unsaturated hydrocarbon radicals and (d) from about 30 to 95 percent by weight of filler based on the weight of the composition, of which at least 10 percent by weight of the filler is silicon nitride particles.

4,544,697

AMPHOTERIC LATEXES CONTAINING PH INDEPENDENT AND PH DEPENDENT BOUND CHARGES

Dale M. Pickelman, Auburn, and Larry D. Yats, Clare, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 21, 1983, Ser. No. 554,034
Int. Cl.[4] C08F *2/16*; C08L *9/04*
U.S. Cl. 524—458 **7 Claims**

1. A selectively stable latex comprising discrete polymer particles which have present as bound charges both

(a) a pH independent charge present at a charge density of about 0.8 to about 0.4 meq/g; and

(b) a pH dependent charge, of opposite polarity of the pH independent charge;

wherein the two charges are provided by an addition polymerizable monomer and are present in such proportion that the net charge density is about 0.02 to about 0.2 meq/g and the latex is stable in at least one pH range and controllably unstable in at least one pH range.

4,544,698

POLYMER COATING COMPOSITION AND ITS USE IN THE MANUFACTURE OF LAYERED PACKAGING

Gilbert Roullet, Tremblay les Gonesse, and Pierre Legrand, Antony, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 158,900, Jun. 12, 1980, abandoned, which is a continuation of Ser. No. 10,217, Feb. 8, 1979, abandoned. This application Apr. 9, 1981, Ser. No. 252,357
Claims priority, application France, Feb. 13, 1978, 78 03940
Int. Cl.[4] C08L *29/04*
U.S. Cl. 524—503 **6 Claims**

1. A composition which, upon drying, provides a moisture resistant, gas and flavor tight coating for use in a packaging material, said composition consisting essentially of an aqueous solution of polyvinyl alcohol containing more than 90% ($-CH_2OH$) groups, a viscosity of less than 20 cp (in solution at 4% water) and an ester index between 2 and 150, and a latex of a water insensitive polymer incompatible with the polyvinyl alcohol selected from the group consisting of vinylidene chloride polymer latexes, the ratio of polyvinyl alcohol to latex polymer expressed by weight of dry material being between 0.4 and 3, said compositions being characterized by inversion to a two-phase coating upon drying in which the water insensitive latex polymer forms a continuous phase and the polyvinyl alcohol forms a discontinuous phase.

4,544,699

COMPOSITION FOR IMPROVED ADHESION OF VINYLIDENE CHLORIDE LATEX TO IONOMER FILMS

John Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 11, 1983, Ser. No. 540,442
Int. Cl.[4] C08L *61/00*
U.S. Cl. 524—512 **30 Claims**

1. An aqueous dispersion of a film-forming vinylidene chloride copolymer comprising on a comonomer weight basis:

(a) from about 45 to 90 percent vinylidene chloride,

(b) from about 5 to about 25 percent of a polar comonomer having one or more hydroxyl groups, and

(c) a cross-linking agent for hydroxyl groups selected from the group consisting of boric acid and water soluble metal salts of boric acid dissolved in the aqueous dispersion of the vinylidene chloride copolymer.

24. An adhesive composition comprising a vinylidene chloride copolymer, said copolymer comprising on a comonomer weight basis:

(a) from about 45 to about 90 percent vinylidene chloride,

(b) from about 5 to about 25 percent of a polar comonomer having one or more hydroxyl groups, and

(c) from about 0.1 to about 30 percent of a plasticizing comonomer for vinylidene chloride reacted to cross-link with:

(d) a cross-linking agent for hydroxyl groups selected from the group consisting of boric acid and water soluble metal salts of boric acid.

4,544,700

POLY(ARYLENE SULFIDE) COMPOSITION CONTAINING AN ETHYLENE POLYMER

Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 16, 1984, Ser. No. 600,754
Int. Cl.[4] C08L *27/21*
U.S. Cl. 524—543 **24 Claims**

1. A composition comprising

(a) a poly(arylene sulfide),

(b) an ethylene polymer having a density in the range of about 0.910 to about 0.940 g/cc and a melt index of greater than about 100 g/10 min present in an amount within the

range of about 0.1 to about 10 weight percent, based on the weight of the composition, and
(c) a fibrous reinforcing material.

4,544,701

STAMP MOLDED PARAFFIN SCRAPER

John H. Walker, Bartlesville, Okla., and Harold V. Wood, Denton, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 28, 1984, Ser. No. 594,046
Int. Cl.[4] C08K *7/00*
U.S. Cl. 524—609 **7 Claims**

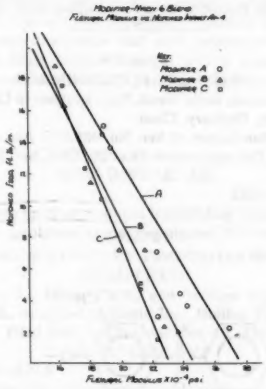
1. A rod guide, suitable for field installation, comprising a pair of substantially identical half-sections adapted to be wedged around a rod in locked position, said half-sections stamp molded from a prepreg containing from about 15 to about 45 weight percent of an inorganic reinforcing agent, formed by surrounding at least one inorganic material fiber mat with a matrix of poly(phenylene sulfide).

4,544,702

MODIFIED IONIC ELASTOMER AND BLEND WITH NYLON

Nedie L. DeVera, Danbury, Conn., assignor to Uniroyal, Inc., Middlebury, Conn.

Filed Jun. 11, 1984, Ser. No. 619,677
Int. Cl.[4] C08L *77/00, 51/00*
U.S. Cl. 525—66 **15 Claims**



1. A polymer blend which comprises an admixture of (a) from 60 to 97 parts by weight of nylon and (b) correspondingly from 40 to 3 parts by weight of an ionic elastomeric adduct containing carboxylic groups, which is a neutralized sulfonated copolymer of ethylene, an alpha-olefin having from 3 to 10 carbon atoms, and a copolymerizable non-conjugated diene, said adduct having succinic acid groups attached thereto, the sulfonic acid content being from 1 to 30 milliequivalents per 100 grams, and the carboxylic content calculated as maleic anhydride being from 0.1 to 10% based on the total weight of the elastomer.

4,544,703

HIGH IMPACT THERMOPLASTIC COMPOSITIONS CONTAINING DIBLOCK IMPACT MODIFIER

William R. Haaf, Voorheesville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 2, 1981, Ser. No. 308,181
Int. Cl.[4] C08L *53/02, 71/04*
U.S. Cl. 525—92 **8 Claims**

1. In a thermoplastic composition comprising a blend of polyphenylene ether and polyalkenyl aromatic resin, the improvement wherein said polyalkenyl aromatic resin comprises diblock copolymer of from 50 to 60% polystyrene and from 50 to 40% hydrogenated polybutadiene by weight.

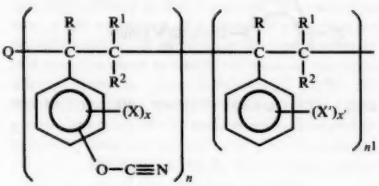
4,544,704

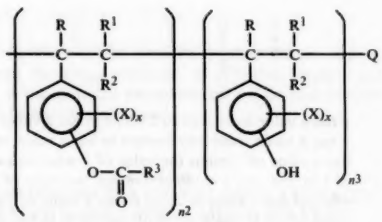
POLYMERIC CYANATE COMPOSITIONS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

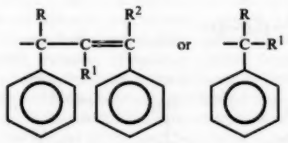
Continuation-in-part of Ser. No. 517,560, Jul. 27, 1983, abandoned. This application Feb. 10, 1984, Ser. No. 578,927
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] C07C *122/00;* C08G *61/02;* C08L *65/00, 63/00*
U.S. Cl. 525—108 **46 Claims**

1. A composition which comprises
(A) from about 1 to 100 percent by weight (pbw) of a polymeric cyanate or mixture of polymeric cyanates represented by the formula



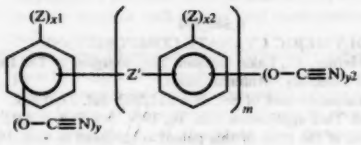


wherein each R, R^1 and R^2 is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; R^3 is an alkyl group having from 1 to about 3 carbon atoms; each X and X' is independently an alkyl group having from 1 to about 4 carbon atoms, chlorine or bromine; Q is independently a group derived from any suitable polymerization initiator or terminator, hydrogen,

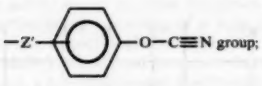


wherein each R, R^1, and R^2 is as defined above, and wherein each aromatic ring may contain any substituent group as those enumerated in the formula I; n has a value of from about 1 to about 5000; n^1 has a value from about 1 to about 5000; n^2 has a value of from about zero to about 1000; n^3 has a value from about zero to about 1000; and each x and x' independently has a value from zero to 4; and
(B) from zero to about 99 pbw of an aromatic polycyanate or mixture of aromatic polycyanates represented by the formula:

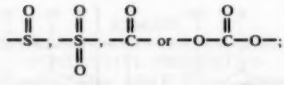
(II)



wherein each Z is independently hydrogen, an alkyl group having from 1 to about 4 carbon atoms, chlorine, bromine, or a



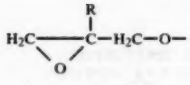
Z' is a direct bond, an alkylene group with 1 to 5 carbon atoms, —S—, —S—S—, —O—,

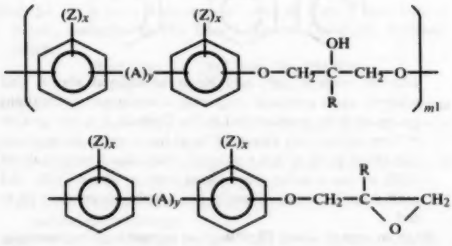


y has a value from zero to 5 when m has a value of 1 to 3; y has a value from 2 to 5 when m has a value of zero; x^1 has a value of 5 minus the value of y when m has a value of 1 to 3; x^1 has a value of 6 minus the value of y plus y^2 when m has a value of zero; x^2 has a value of 5 minus the value of y^2; y^2 has a value of zero to 5; m has a value of zero to 3; with the proviso that the sum of y and y^2 is always at least two; and

(C) from zero to about 99 pbw of an epoxy resin or mixture of epoxy resins represented by the formulas

III

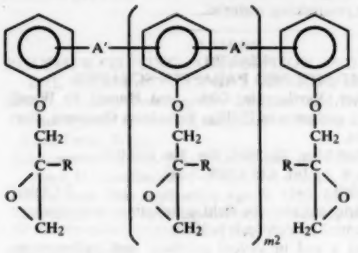




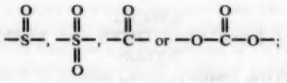
or

-continued

IV



wherein R, Z and x are as hereinbefore defined; each A is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, —S—, —S—S—, —O—,



each A' is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, each y independently has a value of zero or 1; m^1 has a value of zero to about 99; m^2 has a value of 1 to 10 and wherein the pbw of the individual components is based upon total composition.

4,544,705

AROMATIC POLYFORMALS

Louis M. Maresca, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

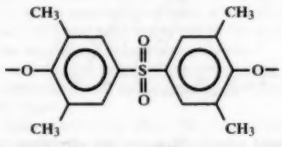
Continuation-in-part of Ser. No. 485,947, Apr. 18, 1983, abandoned. This application Dec. 21, 1983, Ser. No. 564,024

Int. Cl.[4] C08G *65/40*

U.S. Cl. 525—132 **20 Claims**

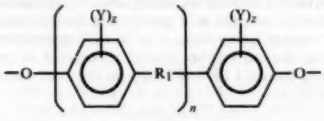
1. An aromatic polyformal comprising from about 5 weight percent to about 95 weight percent of repeating units (I) having the formula

(I)



and from about 95 weight percent to about 5 weight percent of repeating units (II) having the formula

(II)



in which the repeating untis (I) and the repeating units (II) are connected by interbonding units (III) having the formula

—CH_2— (III)

wherein Y is selected from alkyl groups of 1 to 4 carbon atoms, chlorine or bromine, each z, independently, has a value of from 0 to 4 inclusive, n has a value of 0 or 1, and R_1 is a divalent saturated or unsaturated hydrocarbon radical, O, CO, SO_2, S

or a direct bond, with the proviso that when R_1 is SO_2 then repeating unit (II) is not the same as repeating unit (I).

4,544,706

HIGHLY IMPACT RESISTANT CARBONATE POLYMER BLENDS

Charles R. Finch; Leslie E. Wallace, and Thomas E. Evans, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 446,148, Dec. 2, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 550,851
Int. Cl.⁴ C08L *69/00*
U.S. Cl. 525—146 **20 Claims**

1. An extruded sheet-like thermoplastic composition comprising a continuous phase comprising a carbonate polymer, and a discontinuous phase comprising a copolymer of a monovinylidene aromatic comonomer and an α,β-ethylenically unsaturated comomoner having a pendant polar group and monovinylidene aromatic homopolymer; and wherein said copolymer is employed in amounts sufficient to improve the melt processability of the carbonate polymer; and wherein said discontinuous phase comprising a copolymer is in the form of laminar layers distributed within the continuous phase, which layers are essentially parallel to the surface of said sheet-like material; and wherein said copolymer is present in the composition in proportions such that said composition exhibits a Rheometrics Dart impact strength which nearly meets or exceeds that of the essentially pure carbonate polymer.

4,544,707

MANGANESE-TERTIARY PHOSPHINE-POLYMER COMPLEXES

Karl Minten, La Hoya, Calif., and William Krug, Hoffman Estates, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 7, 1984, Ser. No. 607,513
Int. Cl.⁴ C08F *8/42*
U.S. Cl. 525—330.4 **22 Claims**

1. A process of synthesizing polymer complex compositions, comprising the steps of: forming a substantially anhydrous first solution of a polymer selected from the group consisting of polyvinylchloride, polystyrene, polyvinylacetate, and silicone dissolved in a suitable solvent; adding a substantially anhydrous manganese salt of the formula:

$$MnX_2$$

wherein X is a species capable of forming an anion to form a second solution; then adding to said second solution at least a stoichiometric equivalent with respect to said manganese salt of a substantially anhydrous phosphine of the formula:

$$PR^1R^2R^3$$

wherein R^1, R^2, and R^3 may be the same or different, and each is selected from the group consisting of substituted or unsubstituted alkyl, cycloalkyl or aryl groups or hydrogen, provided that no more than two of the groups R^1, R^2, and R^3 are substituted or unsubstituted aryl groups and that at least one of the groups R^1, R^2, and R^3 is a substituted or unsubstituted alkyl, cycloalkyl or aryl group.

4,544,708

VULCANIZABLE FLUOROELASTOMER COMPOSITIONS PROVIDING VULCANIZATES HAVING HIGH ADHESION TO METALS

Giovanni Moggi, Milan, and Gianna Cirillo, Genoa, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 24, 1983, Ser. No. 583,398
Claims priority, application Italy, Mar. 22, 1983, 20197 A/83
Int. Cl.⁴ C08F *8/00*
U.S. Cl. 525—337 **2 Claims**

1. A vulcanizable fluoroelastomeric composition, comprising:

(A) an elastomeric copolymer based on vinylidene fluoride and on at least another fluorinated monomer;

(B) a substance endowed with the property of neutralizing acids and selected from the group consisting of the oxides of divalent metals, hydroxides of divalent metals and mixtures of said oxides and hydroxides with metal salts of weak acids;

(C) an aromatic polyhydroxyl compound which acts as a vulcanizing agent for the copolymer,

and characterized in that it contains, as a vulcanization accelerator, a salt consisting of a cation of phosphonium, of aminophosphonium, or of ammonium of a type known in the art, and of a complex anion in which one atom or two atoms of a metal selected from the group consisting of Cd(II), Zn(II), Pd(II), and Ni(II) is or are bound to a halogen atom selected from the group consisting of chlorine, bromine and iodine atoms and, optionally, also to a trisubstituted phosphinic binder of the type $P(C_6H_5)_3$, $P[N(CH_3)(C_6H_5)]_3$, said complex anion being represented by one of the following formulae:

$$(MeX_4)^{2-}, (MeX_3Y)^-, (Me_2X_6)^-$$

wherein Me is one of the aforesaid divalent metals, X is selected from the group consisting of chlorine, bromine and iodine, Y is the aforesaid phosphinic binder, or said complex anion can be tetraphenylborate.

4,544,709

PROCESS FOR PRODUCING CHLOROSULFONATED POLYETHYLENE USING A MIXED SOLVENT

Mamoru Narui, Kudamatsu; Tatsushi Nakagawa, and Yasuhiro Sakanaka, both of Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 363,886, Mar. 31, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 578,325
Claims priority, application Japan, Apr. 30, 1981, 56-64271
Int. Cl.⁴ C08F *8/38*
U.S. Cl. 525—344 **7 Claims**

1. A process of producing chlorosulfonated polyethylene by dissolving polyethylene in a mixed solvent and reacting it with either sulfuryl chloride or sulfuryl chloride and chlorine, wherein said mixed solvent comprises carbon tetrachloride and a halogenated aromatic compound selected from the group consisting of chlorobenzene, chlorotoluene, iodobenzene, benzenefluoride and bromobenzene, and further wherein the proportion of said halogenated aromatic compound is between 1.0 and 10.0% by weight of the total amount of mixed solvent.

4,544,710

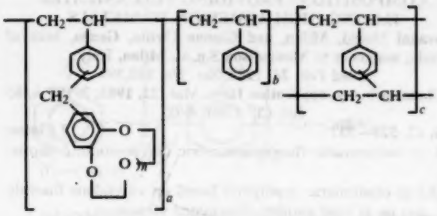
POLYMER BOUND ARYL SUBSTITUTED CROWN ETHERS

Dane K. Parker, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 4, 1982, Ser. No. 354,563
Int. Cl.⁴ C08F *8/00*
U.S. Cl. 525—332.2 **1 Claim**

1. A polymer defined by the following structural formula (I)

(I)



wherein n is 3 or 4 and the ratio of a to b to c may vary from 1:98:1 to 50:49:1 to 1:49:50.

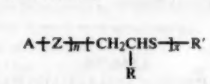
4,544,711

PROCESS FOR MAKING TERMINALLY FUNCTIONAL POLYMERS

Paul A. Mancinelli, Aston, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 15, 1984, Ser. No. 621,315
Int. Cl.[4] C08F *8/34*
U.S. Cl. 525—348 **4 Claims**

1. A method for making functionally terminated polymers comprising polymerizing monomers susceptible to anionic polymerization with an alkyllithium initiator to a polymer chain of number average molecular weight of between 300 and 150,000, reacting the polymer chain with an alkylene sulfide and then terminating the chains with a halogenated compound containing a polymerizable moiety to form a macromolecular monomer of general formula



where A is the alkyl portion of an alkyllithium initiator, Z is a repeating monomeric unit of a monomer susceptible to anionic polymerization, n is a positive interger from 3 to 1500, R is either hydrogen, C_1–C_{10} alkyl, or phenyl, x is a positive integer of at least 1, and R′ is a radical formed by removal of the halogen from a halogenated compound containing a moiety polymerizable by free-radical, cationic, or anionic initiators.

4,544,712

ESTER-CONTAINING HALOPOLYALKYLENES

Michael I. Naiman, St. Louis, and John A. Schield, Chesterfield, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 626,830, Jul. 2, 1984, , and a continuation-in-part of Ser. No. 432,494, Oct. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 356,994, Mar. 11, 1982, Pat. No. 4,471,098. This application Apr. 22, 1985, Ser. No. 725,855
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—356 **9 Claims**

1. A linear halogenated polyalkylene characterized as:
(a) being essentially free of crosslinking;
(b) having vinyl unsaturation in the backbone; and
(c) having at least about 1 per cent of the halogen groups replaced by ester groups.

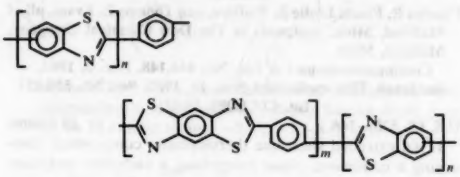
4,544,713

METHOD FOR MAKING HETEROCYCLIC BLOCK COPOLYMER

Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 16, 1984, Ser. No. 610,912
Int. Cl.[4] C08G *73/08*
U.S. Cl. 525—432 **12 Claims**

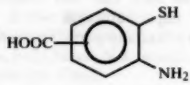
1. A method for preparing a thermally stable aromatic heterocyclic block copolymer of the general formula



wherein m is an integer equal to the number of repeating units of the rigid rod segment and n is an integer equal to the number of repeating units of the flexible end segments, which comprises the steps of

(a) reacting 2,5-amino-1,4-dithiobenzene with terephthalic acid in polyphosphoric acid (PPA) under reaction conditions to form carboxy-terminated rigid rod segments;

(b) adding an amino monomer of the general formula



to the reaction mixture of PPA and rigid rod segments, and polymerizing said amino monomer to form flexible segments grafted onto said rigid rod segments; and

(c) recovering the resulting block copolymer.

4,544,714

ODORANT OXIMES

Paul A. Ochsner, Geneva, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Jan. 26, 1983, Ser. No. 461,053
Claims priority, application Switzerland, Feb. 3, 1982, 645/82
Int. Cl.[4] C11B *9/00*; C07C *131/00*
U.S. Cl. 252—522 R **16 Claims**

1. A compound of the formula

I

wherein:

R is a $\Delta^{3,4}$ alkenyl group of six to twelve carbons, and

R′ is an alkyl group of one to four carbons, provided that the total number of carbon atoms in the compound is between eleven and fourteen.

11. An odorant composition comprising an olfactorily effective amount of a compound of the formula

I

wherein:

R is a $\Delta^{3,4}$ alkenyl group of six to twelve carbons, and

R' is an alkyl group of one to four carbons, provided that the total number of carbon atoms in the compound is between eleven and fourteen

and at least one other olfactory agent.

4,544,715

HARDENING COMPONENTS FOR PAINT BINDERS

Willibald Paar, and Rudolf Schipfer, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jun. 18, 1984, Ser. No. 621,269

Claims priority, application Austria, Jun. 20, 1983, 2258/83

Int. Cl.[4] C08L *63/02*

U.S. Cl. 525—528 **10 Claims**

1. A water-dilutable cationic paint binder comprising (a) from 60 to 85% by weight of a synthetic resin which will undergo neutralization with an acid, contains functional groups which are esterifiable or capable of amidification and which is water dilutable after at least partial neutralization with an acid, and (b) from 15 to 40% by weight of a hardener compound which crosslinks at elevated temperature with said functional groups of (a) through esterification or amidification and which comprises

(A) a KNOEVENAGEL (COPE) reaction product at an elevated temperature of a carbonyl compound and a compound of the general formula

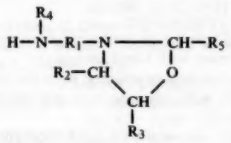
wherein

X is—COOR, —CN or —$COCH_3$,

Y is —COOR, and

R is an alkyl radical having from 1–4 C-atoms, reacted at an elevated temperature in a MICHAEL-addition reaction with

(B) a substituted oxazolidine carrying a secondary amino group and having the general formula



wherein

R_1 is a straight chain, branched chain, or cyclic alkylene radical having from 2–12 C-atoms or an aralkylene radical,

R_2 is a hydrogen atom or a methyl group,

R_3 is a hydrogen atom or an alkyl radical,

R_4 is the radical of an acrylic or methacrylic monomer, monofunctional with regard to reaction with a double bond and remaining after reaction with an active hydrogen atom, and

R_5 is a hydrogen atom or an alkyl radical having from 1–12 C-atoms or an aryl radical,

and said reaction product of (A) and (B) thereafter reacted at elevated temperature through the active methylene groups with

(C) a polyisocyanate, the quantity of isocyanate groups being chosen to correspond to the active methylene groups of the oxazolidine rings.

4,544,716

POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Gil R. Hawley, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1984, Ser. No. 623,310

Int. Cl.[4] C08F *4/02, 10/06*

U.S. Cl. 526—119 **14 Claims**

1. A process for the polymerization of alpha olefins comprising contacting said alpha olefins under polymerization conditions with a catalyst prepared by reacting an alkoxytitanium compound, a phenol, and a small quantity of water in a hydrocarbon liquid, then reacting the resulting solution with a magnesium dihalide having less than 1.5 moles of water per mole of magnesium dihalide to form a first catalyst component solution, then reacting that solution with an organoaluminum halide to form a solid product, and then reacting said solid product with a halogenating agent comprising a titanium halide, wherein the amount of water employed in forming said first catalyst component solution is such that the catalyst is more active than if no water were employed.

4,544,717

POLYMERIZATION CATALYSTS

Adolfe Mayr; Ermanno Susa; Antonio Leccese, all of Ferrara; Velmore Davoli, Reggio Emilia, and Ettoro Giachetti, Milan, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 543,795, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 350,525, Apr. 12, 1973, abandoned, which is a continuation of Ser. No. 47,550, Jun. 18, 1970, abandoned. This application May 22, 1980, Ser. No. 152,531

Claims priority, application Italy, Jun. 20, 1969, 18462 A/69; Jun. 27, 1969, 18823 A/69

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.[4] C08F *4/02, 10/02*

U.S. Cl. 526—125 **17 Claims**

1. A supported component of catalysts for the polymerization of olefins comprising the product obtained by contacting (1) an addition compound of a tri- or tetravalent titanium compound selected from the group consisting of the halides, oxyhalides and alcoholates with an electron-donor compound, or such tri- or tetravalent titanium compound and an electron-donor compound with (2) a support comprising an anhydrous magnesium dihalide in an active form, showing an X-ray powder spectrum in which the most intense diffraction line appearing in the spectrum of normal non-activated magnesium dihalide is less intense.

4,544,718

OLEFIN POLYMERIZATION

Gene H. C. Yeh; Joel L. Martin, and Henry L. Hsieh, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 13, 1984, Ser. No. 650,034

Int. Cl.[4] C08F *4/12*

U.S. Cl. 526—141 **8 Claims**

1. A process for the polymerization of olefins which comprises contacting at least one olefin under polymerization conditions with a catalyst composition comprising a component A formed by admixing a rare earth metal hydroxyhalide and an electron donor bidentate organic ligand having from 2 to about 20 carbon atoms selected from among diamines, dihydric alcohols, and diketones, and a component B comprising an organoaluminum compound.

4,544,719

WATER-SOLUBLE POLYMERS CONTAINING 2-ACRYLAMIDO-2-METHYLPROPANE-SULFONIC ACID, SODIUM SALT (AMPS)-ACRYLAMIDE-N,N-DIALLYLACETAMIDE

David M. Giddings, Sugar Land; Donald G. Ries, and Allen R. Syrinek, both of Richmond, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 530,814, Sep. 9, 1983, Pat. No. 4,502,966.
This application Oct. 26, 1984, Ser. No. 665,196
Int. Cl.[4] C08F *228/02*
U.S. Cl. 526—240 **3 Claims**

1. Novel water-soluble terpolymers having a molecular weight below 1,000,000 comprising:

Ingredients	Mole %
2-acrylamido-2-methylpropane-sulfonic acid, sodium salt (AMPS)	57–61
acrylamide	20–35
N,N—diallylacetamide	4–23

4,544,720

FLUORINE-CONTAINING COPOLYMER

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki; Hiroshi Inukai, and Yoshiki Shimizu, both of Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 21, 1984, Ser. No. 653,005
Claims priority, application Japan, Sep. 21, 1983, 58-175123
Int. Cl.[4] C08F *214/18, 214/26*
U.S. Cl. 526—247 **2 Claims**

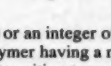
1. A fluorine-containing copolymer comprising (a) 50–99 mole % of structural units of the formula:

$$-CH_2-CF_2-$$

and (b) 1–50 mole % of structural units of the formula:

$$-CF_2-\underset{\displaystyle (CF_2\rightarrow_m(CH_2\rightarrow_n X}{\overset{\displaystyle |}{CF}}-$$

wherein X is —OH, or



m is 0 or an integer of 1 to 10 and n is an integer of 1 to 4, said copolymer having a molecular weight of 10,000–500,000 and a glass transition temperature of −40° C. to 70° C.

4,544,721

CHLOROTRIFLOUROETHYLENE POLYMER ORIENTED FILMS

Stanley B. Levy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1983, Ser. No. 539,399
Int. Cl.[4] B29D *7/24;* **B29G** *7/00;* **C08F** *14/24*
U.S. Cl. 526—249 **5 Claims**

1. A film of semi-crystalline poly(chlorotrifluoroethylene) or a semi-crystalline copolymer of chlorotrifluoroethylene which contains up to 5% by weight of units of an ethylenically unsaturated copolymerizable organic monomer selected from the class consisting of alpha-olefins, fluorinated alpha-olefins and fluorinated ethers, which film has been oriented by stretching a substantially amorphous form of the film at least 2.5 times, at a temperature at least 40° C. above the second order transition temperature at a ratio of film width to length of stretch zone of greater than 3, so that the film, after cooling under tension for two minutes at about 150° C. exhibits a shrinkage of 0 to 2 percent in a first direction in the plane of the film, and a shrinkage of at least 12 percent in a second direction in the same plane as the first and which is perpendicular to the first direction.

4,544,722

WATER-SOLUBLE TERPOLYMERS OF 2-ACRYLAMIDO-2-METHYLPROPANE-SULFONIC ACID, SODIUM SALT (AMPS), N-VINYLPYRROLIDONE AND ACRYLONITRILE

David M. Giddings, Sugar Land; Donald G. Ries, and Allen R. Syrinek, both of Richmond, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 530,796, Sep. 9, 1983, Pat. No. 4,502,965.
This application Oct. 25, 1984, Ser. No. 665,250
Int. Cl.[4] C08F *226/10*
U.S. Cl. 526—264 **3 Claims**

1. Novel water-soluble terpolymers having a molecular weight below 1,000,000 comprising:

Ingredients	Mole %
2-acrylamido-2-methylpropane-sulfonic acid, sodium salt (AMPS)	58–77
N—vinylp;yrrolidone	2–20
acrylonitrile	4–36

4,544,723

VINYL ACETATE POLYMERS AND LATEX COMPOSITIONS CONTAINING SAME

Donald A. Upson, Webster, and David J. Steklenski, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 401,205, Jul. 23, 1982, Pat. No. 4,448,850.
This application Oct. 31, 1983, Ser. No. 547,263
Int. Cl.[4] C08F *224/00, 134/02, 212/30, 218/02*
U.S. Cl. 524—347 **9 Claims**

1. A polymer comprising random recurring units having the structure:

$$\text{—(A)}_w\text{—(B)}_x\text{—(C)}_y \text{ and —(D)}_z$$

wherein:

A represents polymerized vinyl acetate;
B represents a polymerized acrylate or methacrylate monomer capable of copolymerization with vinyl acetate;
C represents a polymerized monomer selected from the group consisting of methacrylic acid, itaconic acid and vinylbenzoic acid;
D represents a polymerized cationically charged copolymerizable monomer;
w represents from 20 to 85 weight percent;
x represents from 5 to 65 weight percent;
y represents from 5 to 50 weight percent; and
z represents from 2 to 10 weight percent.

4,544,724

SILYLATED VINYL ALCOHOL POLYMERS

Dotsevi Y. Sogah, and Owen W. Webster, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1984, Ser. No. 622,115
Int. Cl.[4] C08G *77/16*
U.S. Cl. 526—279 **61 Claims**

1. Polymer consisting essentially of the polymer of the formula

$$R_H(Y^2\text{—}CH(OSi[R^1]_3)CH_2\text{—}_nCHO)_x \qquad (I)$$

wherein:

R_H is H or a hydrocarbyl radical of valence x which is alkyl, cycloalkyl, aryl, alkaryl or aralkyl, containing up to 20 carbon atoms, or a polymeric radical containing at least 20 carbon atoms, and which, optionally, contains ether oxygen and/or one or more functional substituents which are unreactive under its preparative polymerizing conditions;

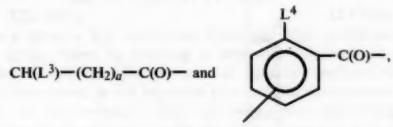
x is an integer and is at least 1;

n is an integer and is at least 5;

Y^2 is $Y^3(C[R^4]_2)_y$;

Y^3 is a connecting bond or a divalent radical selected from

$-C(O)-$, $-R^2-$, $-N(R^3)CH_2-$, $-CH(L^1)-$, $-CH(L^2)CH_2-$,



$CH(L^3)-(CH_2)_a-C(O)-$ and

wherein

R^2 is C_{1-10} alkylene or C_{7-20} aralkylene, R^3 is C_{1-4} alkyl, L^1 is $-OR^5$, $-OR^6OSi[R^1]_3$ or $-OSi[R^1]_3$, wherein R^5 is C_{1-4} alkyl and R^6 is C_{1-4} alkylene, L^2 is $-OSi[R^1]_3$, L^3 is $-(CH_2)_b-C(O)OSi[R^1]_3$, L^4 is $-C(O)OSi[R^1]_3$, and each of a and b, independently, is 0, 1 or 2;

Y is 0 or 1;

each R^1 is independently selected from C_{1-10} alkyl, alkenyl having 2 or 4–10 carbon atoms, and C_{6-10} aryl, alkaryl and aralkyl; and

each R^4 is independently selected from H, C_{1-10} alkyl and C_{6-10} aryl, aralkyl and alkaryl.

4,544,725

COMPOSITION BASED ON ALIPHATIC POLYCARBONATES WHICH CONTAIN URETHAN GROUPS AND ACRYLIC OR METACRYLIC END GROUPS, TO BE CROSS-LINKED IN THE PRESENCE OF RADICALIC INITIATORS

Aldo Priola, S. Donato Milanese; Ugo Romano, Vimercate, and Fiorenzo Renzi, Gorgonzola, all of Italy, assignors to Anic S.p.A., Milan, Italy

Filed Apr. 14, 1983, Ser. No. 484,954

Claims priority, application Italy, Apr. 15, 1982, 20749 A/82

Int. Cl.⁴ C08F *126/02, 226/02*

U.S. Cl. 526—301 **15 Claims**

1. A composition based on aliphatic polycarbonates containing urethane groups and acrylic or methacrylic end groups, capable of being cross-linked in the presence of radicalic initiators for the functionalization with acrylic or methacrylic groups of a mixture composed of diols and their OH-terminated oligomeric derivatives or polyols and their OH-terminated oligomeric derivatives containing in their molecules carbonate groups and urethane groups which composition is prepared by a process comprising the steps of reacting the mixture of diols or and their oligomeric OH-terminated derivatives which contain carbonate groups or polyols and their oligomeric OH-terminated derivatives with contain carbonate groups, in an initial stage with a primary diamine having the general formula: $H_2N—R—NH_2$ wherein the R is an alkylene radical, a straight or branched chain aliphatic, cycloaliphatic or aryl-alkyl radical, having from 2–16 carbon atoms and thereafter functionalizing the OH groups in said mixture with the acrylic or the methacrylic group by reaction with an acrylic or methacrylic acid, ester or acid chloride.

4,544,726

EMULSION POLYMERIZATION EMULSIFIER

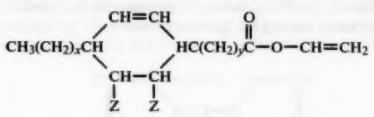
John A. Alford, Goose Creek; Carlton G. Force, Mt. Pleasant, both of S.C., and John W. Gowan, Jr., Columbia, Md., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 3, 1984, Ser. No. 657,233

Int. Cl.⁴ C08F *36/00*

U.S. Cl. 526—309 **10 Claims**

1. In an emulsion polymerization process comprising combining monomer, emulsifier, initiator and water as the continuous phase, the improvement wherein the emulsifier is a half vinyl ester of C_{21}-dicarboxylic acid of the general formula



wherein x and y are integers from 3 to 9, x and y together equal 12, one Z is COOH and the other Z is hydrogen.

4,544,727

COPOLYMERS OF ACRYLONITRILE, STYRENE, AND PARA-ISOPROPENYLPHENOL

Kenji Ema, Yokohama; Jun Saito, Kamakura; Takatoshi Mitsuishi, Isehara, and Shuhei Ikado, Yokohama, all of Japan, assignors to Wakabayashi Patent Agency, Tokyo, Japan

Continuation of Ser. No. 448,857, filed as PCT JP82/00129, Apr. 19, 1982; § 102(e) date Dec. 10, 1982, abandoned.

This application Jul. 30, 1984, Ser. No. 635,496

Claims priority, application Japan, Apr. 21, 1981, 56-59189

Int. Cl.⁴ C08F *216/02, 212/24, 212/10*

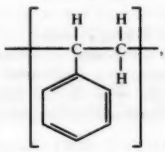
U.S. Cl. 526—313 **5 Claims**

1. Copolymer consisting of 30 to 65 mole percent of structural units having the formula:

(I)

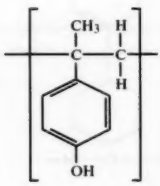
5 to 45 mole percent of structural units having the formula:

(II)



and 10 to 60 mole percent of structural units having the formula:

(III)



and having a number average molecular weight of 500 to 200,000.

4,544,728

STORAGE-STABLE THERMOSETTING COMPOSITIONS COMPRISING IMIDO PREPOLYMERS

Rene Dien, Millery, and Guy Poulain, Gournay sur Marne, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Oct. 25, 1984, Ser. No. 664,795

Claims priority, application France, Oct. 25, 1983, 83 17218

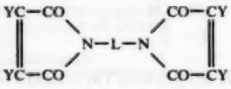
Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—21 **15 Claims**

1. A thermosetting composition of matter which comprises:

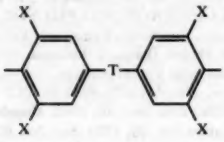
(A) a prepolymeric reaction product of:

(a) a diimide or plurality of diimides, or combination of diimide and N-cyclohexylmaleimide, each such diimide or diimides having the general formula:



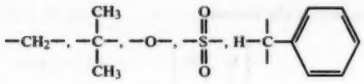
(1)

wherein Y is H or CH_3 and L is cyclohexylene, phenylene, tolylene, 2,5-diethyltolylene, or a radical of the formula:



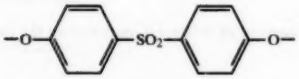
(2)

in which T is:



(3)

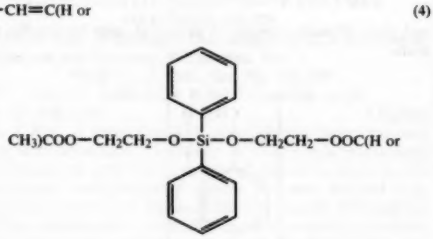
or



and X is H, CH_3 or isopropyl; with

(b) an organosilicon compound comprising at least one hydroxy group bonded to a silicon atom thereof;

(B) a triallyl isocyanurate, or an acrylic ester of an ethoxy-phenylated siloxane compound of the general formula:



(4)

in which R is H, CH_3 or C_2H_5; and

(C) an imidazole compound.

4,544,729

PHOTO AND RADIATION-SENSITIVE ORGANOPOLYMERIC MATERIAL

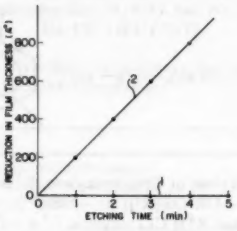
Kazuo Nate, Machida; Takashi Inoue, Yokohama; Hitoshi Yokono, Fujisawa; Mitsuo Ishikawa, Hirakata, and Makoto Kumada, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,168

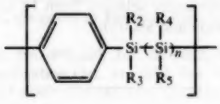
Claims priority, application Japan, Jun. 24, 1983, 58-112744; Jul. 1, 1983, 58-118332; Aug. 24, 1983, 58-153294; Sep. 16, 1983, 58-169185

Int. Cl.[4] C08G *77/04*

U.S. Cl. 528—28 **6 Claims**



1. A photo and radiation-sensitive organopolymeric material which consists of units represented by the general formula (1):



(1)

wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of methyl, ethyl, propyl and phenyl; and n is an integer of 1 to 5.

4,544,730

MODIFIED POLYURETHANE LIQUID POLYMER COMPOSITIONS

James M. O'Connor, Clinton; Donald L. Lickei, Cheshire, and Michael L. Rosin, Madison, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 571,216, Jan. 16, 1984, , which is a continuation-in-part of Ser. No. 419,684, Sep. 20, 1982, abandoned, which is a division of Ser. No. 203,212, Nov. 30, 1980, abandoned. This application Nov. 2, 1984, Ser. No. 667,695

Int. Cl.[4] C08G *18/48;* **C08L** *75/00*

U.S. Cl. 528—78 **10 Claims**

1. A process for preparing a polyurethane polymer product comprising mixing a urethane oligomer, a heat activated free radical generating catalyst, and at least one additional component selected from a reinforcing agent and a filler to a homogeneous blend, and then heating said mixture at a temperature adequate to activate said catalyst and cure said mixture, said urethane oligomer having a final free NCO content from 0% to about 20% and containing terminal reactive unsaturation and being prepared by reacting

(a) an isocyanate-terminated prepolymer having a final free NCO content ranging from about 0.5% to about 30% which is the product of reacting

(1) an organic polyisocyanate with

(2) a, polyol having

(i) an average equivalent weight of about 75 to about 500,

(ii) an average functionality of at least about 3, with

(b) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of
(1) hydroxyalkyl acrylates,
(2) hydroxyalkyl methacrylates and
(3) hydroxyalkyl acrylamides.

4,544,731

METHOD FOR PREPARING ADVANCED EPOXY RESINS

Michael B. Cavitt, Lake Jackson, and David J. Duncan, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 7, 1985, Ser. No. 689,417
Int. Cl.⁴ C08G *59/14, 59/62*
U.S. Cl. 528—89 **12 Claims**

1. In a process for preparing relatively high molecular weight epoxy resins by reacting at least one relatively low molecular weight epoxy resin with at least one polyhydric phenolic compound in the presence of a suitable advancement catalyst; the improvement which comprises also conducting the reaction in the presence of an effective quantity of at least one organic unsaturated compound so as to reduce the hydrolyzable halide content in the resultant relatively high molecular weight epoxy resin and/or prevent increases in the EEW of the advanced epoxy resin while held at elevated temperatures.

4,544,732

HEAT-CURABLE COMPOSITION

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,505
Int. Cl.⁴ C08G *59/50*
U.S. Cl. 528—90 **16 Claims**

1. A curable composition comprising (1) a polyepoxide, (2) at least one aromatic or aliphatic amine, (3) a catalytic amount of a trihydrocarbyl sulfonium salt, (4) at least one unsaturated aromatic monomer and (5) a curing amount of a free radical curing agent.

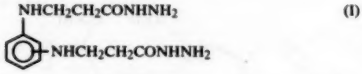
4,544,733

LATENT CURING AGENTS FOR EPOXY RESINS

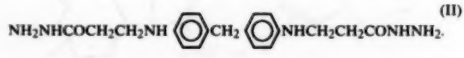
Kiyomiki Hirai, Kawasaki; Koji Takeuchi, Yokohama; Masahiro Abe, Kawasaki, and Nobuo Ito, Oisomachi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,989
Claims priority, application Japan, Nov. 21, 1983, 58-219224
Int. Cl.⁴ C08G *59/44*
U.S. Cl. 528—123 **9 Claims**

1. A compound having the formula (I) or (II):

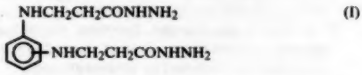


(I)

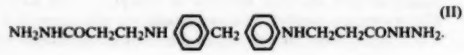


(II)

5. A curable epoxy resin composition comprising (a) an epoxy resin having an average of more than one epoxy group per molecule and (b), as curing agent, a compound having formula (I) or (II):



(I)



(II)

4,544,734

MODIFIED THERMOPLASTIC COPOLYETHERIMIDE ESTER ELASTOMERS

Russell J. McCready, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 26, 1984, Ser. No. 665,315
Int. Cl.⁴ C08G *63/44, 69/44*
U.S. Cl. 528—288 **29 Claims**

1. A polyetherimide ester composition comprising the reaction product of
(a) one or more low molecular weight diols,
(b) one or more dicarboxylic acids, and
(c) a combination of (i) one or more polyoxyalkylene diimide diacids and (ii) one or more dimer acids wherein the amount of dimer is from about 5 to about 40 percent by weight based on the combined weight of (i) and (ii).

4,544,735

PREPARATION OF POLY(ARYLENE SULFIDE) FROM HALOTHIOPHENOL AND ALKALINE METAL HYDROXIDE

Jon F. Geibel; Michael D. Cliffton, and Timothy P. Murtha, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 7, 1984, Ser. No. 618,295
Int. Cl.⁴ C08G *75/14*
U.S. Cl. 528—374 **5 Claims**

1. A method for producing high molecular weight poly(arylene sulfide) comprising:
(a) contacting alkali metal hydroxide, organic amide, and halothiophenol to form a reaction mixture, said halothiophenol represented by the formula XRSH, where R is a divalent hydrocarbon radical selected from arylene, alkyl-substituted arylene, cycloalkyl-substituted arylene, or aryl-substituted arylene, the number of carbon atoms in said R group being within the range of 6 to about 20 and X being a halogen selected from fluorine, chlorine, bromine, or iodine, said alkali metal hydroxide and halothiophenol present in a molar ratio of about 1.6 to about 3.2 alkali metal hydroxide to halothiophenol, and
(b) maintaining at least a portion of said reaction mixture at polymerization conditions to produce a polymer.

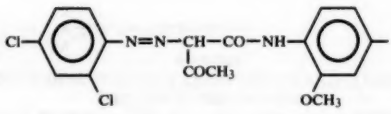
4,544,736

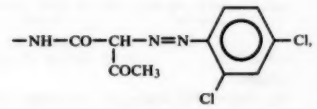
1,4-DI-[2'-(2'',4''-DICHLOROPHENYLAZO)-3'-OXOBUTYRAMIDO]-2-METHOXYBENZENE

Bansi L. Kaul, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 26, 1983, Ser. No. 498,295
Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220463
Int. Cl.⁴ C09B *33/14, 33/153, 67/20*
U.S. Cl. 534—575 **1 Claim**

1. The β-modification of the compound of the formula





said β-modification having an X-ray diffraction spectrum (CuK_α radiation) exhibiting lines at d-values of 8.5, 7.5, 3.88, 3.7, 3.5, 3.28 and 3.16 Å.

4,544,737

PIPERAZINYL-TRIAZINYLNAPHTHOLSULPHONIC ACID AZO DYES

Frank-Michael Stöhr, Burscheid, and Horst Nickel, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

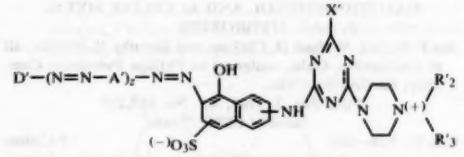
Continuation-in-part of Ser. No. 360,287, Mar. 22, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 586,903

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114088

Int. Cl.[4] **C09B** *44/00, 44/02, 44/08;* **D06P** *1/08*

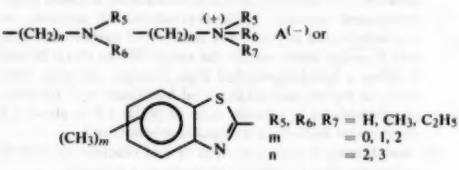
U.S. Cl. 534—605 **4 Claims**

1. A triazine dyestuff of the formula



wherein

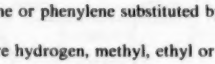
D′ is phenyl or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, acetylamino, benzoylamino, phenoxy



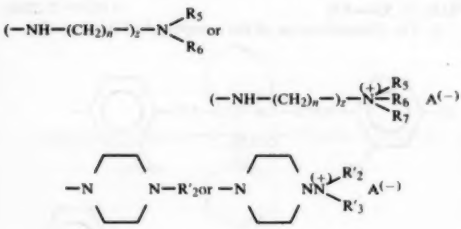
A′ is phenylene or phenylene substituted by methyl or methoxy,

R'_2 and R'_3 are hydrogen, methyl, ethyl or $-(CH_2)_n-Y$

Y is hydroxy,



X′ is



n is 2 or 3,

z is 0 or 1,

$A^{(-)}$ is an anion and

wherein the sum of the basic and cationic groups is at least 2.

4,544,738

REACTIVE PYRAZOLE GROUP CONTAINING MONOAZO DYE

Hans Baumann, and Hermann Kaack, both of Wachenheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

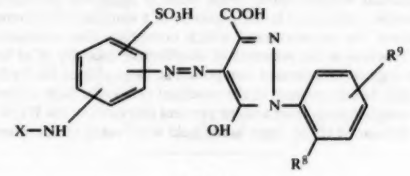
Continuation of Ser. No. 29,043, Apr. 11, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,179

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817033

Int. Cl.[4] **C09B** *62/008, 62/085, 62/245, 62/665*

U.S. Cl. 534—617 **4 Claims**

1. A dye of the formula



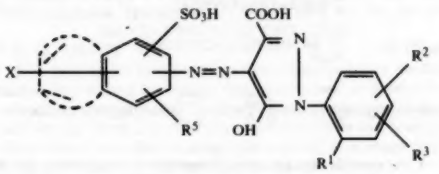
wherein

R^8 is fluorine, chlorine, bromine, methyl, ethyl, trifluoromethyl, methoxy or ethoxy;

R^9 is hydrogen, chlorine, methyl, ethyl, methoxy or ethoxy; and

X is a reactive radical capable under dyeing or printing conditions of forming a covalent bond with the substrate being dyed or printed selected from the group consisting of 2,4-dichloro-triazin-6-yl, 2,4-di-chloropyrimidin-6-yl, 2,5,6-trichloro-pyrimidin-4-yl, 2,5,6-tri-fluoropyrimidin-4-yl, 2,6-difluoro-5-chloropyrimidin-4-yl, 2,4-dichloropyrimidine-5-carbonyl, 2,6dichloro-5-cyano-pyrimidin-4-yl, 3,4,6-trichloro- and tri-fluoropyridazin-5-yl, 2,3-dichloroquinoxaline-6-carbonyl, 2-chlorobenzthiazole-6-carbonyl, chloroacetyl, β-chloropropionyl, α,β-dichloro-propionyl, α,β-dibromopropionyl, acrylyl or α-bromoacrylyl.

2. A dye of the formula:



wherein

R^1 is fluorine, chlorine, bromine, methyl, ethyl, cyano, carboxyl, nitro, trifluoromethyl, acetyl, C_1–C_4 alkoxy, phenoxy, chlorophenoxy or benzoyl;

R^2 is hydrogen, chlorine, bromine, methyl, ethyl, C_1–C_4 alkoxy, benzthiazol-2-yl, 6-methylbenzthiazol-2-yl, acetylamino, carboxyl or aminocarbonyl;

R^3 is hydrogen, chlorine, bromine or methyl;

R^5 is hydrogen, methyl, methoxy or ethoxy; and

X is fluorohydroxyphosphonyl or dihydroxyphosphonyl.

4,544,739

FIBRE-REACTIVE CHROMIUM COMPLEX AZO-AZOMETHINE DYES

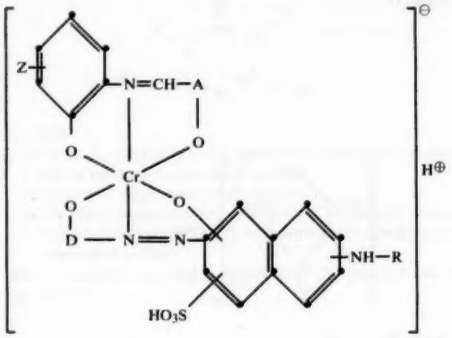
Hans U. Schütz, Basel, and Arthur Bühler, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 196,423, Oct. 14, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,595

Int. Cl.⁴ C09B *62/012, 62/095, 62/255, 62/477*

U.S. Cl. 534—619 **3 Claims**

1. A chromium complex dye which, in the form of the free acid, has the formula



wherein Z is hydrogen, nitro, chlorine or naphthylazo or phenylazo, wherein naphthyl or phenyl is unsubstituted or substituted by nitro, chlorine, bromine, C_{1-5}-alkyl or C_{1-5}-alkoxy, A is naphthyl or phenyl containing the oxygen atom in o-position to the azomethine and wherein naphthyl or phenyl is unsubstituted or substituted by C_{1-5}-alkyl, halogen or naphthylazo or phenylazo wherein naphthyl or phenyl is unsubstituted or substituted by nitro, chlorine, bromine, C_{1-5}-alkyl or C_{1-5}-alkoxy, D is sulfophenyl which is unsubstituted or substituted by nitro or chlorine, or sulfonaphthyl which is unsubstituted or substituted by nitro, and is bonded to the azo group in the ortho-position to the oxygen atom and R is chloroacetyl, bromoacetyl, α-chloroacryloyl, α-bromoacryloyl, α,β-dichloropropionyl, α,β-dibromopropionyl, 5-chloro-2,4-difluoropyrimidyl or 2-chloro- or 2-fluorotriazin-6-yl substituted in the 4-position by amino, N-C_{1-4}-alkylamino, N,N-di-(C_{1-4}-alkyl)-amino, phenylamino, monosulfophenylamino, disulfophenylamino, C_{1-4}-alkoxy, β-methoxyethoxy, phenoxy, monosulfophenoxy, disulfophenoxy, hydroxy, mercapto, C_{1-4}-alkylmercapto or phenylmercapto.

4,544,740

PROCESS FOR THE PREPARATION OF 5-(2-BROMOVINYL)-URIDINE

Anna Szabolcs née Borbás; László Ötvös; János Sági; Attila Szemző; Mária Peredy née Kajtár; István Horváth; István Koczka; Csilla Réthási; Pál Iván; Ildikó Fritzsche née Lukács, and János Nagy, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

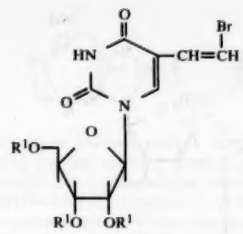
Filed Sep. 7, 1982, Ser. No. 415,424

Claims priority, application Hungary, Sep. 7, 1981, 2571/81

Int. Cl.⁴ C07H *19/08*

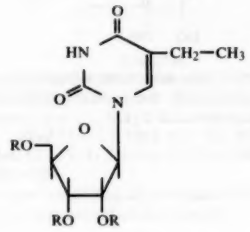
U.S. Cl. 536—23 **8 Claims**

1. A process for the preparation of (E)-5-(2-bromovinyl)-uridine and its derivatives of formula VI,



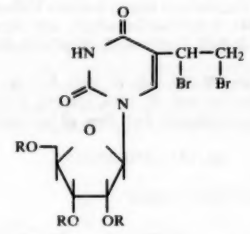
VI

wherein R^1 stands for hydrogen, C_{1-8} alkanoyl, benzoyl or benzoyl substituted in the para position either with C_{1-4} alkyl or halogen, by brominating 2',3',5'-tri-O-acyl-5-ethyl-uridine of formula IV,



IV

wherein R is identical with R^1 as defined above, except where R^1 stands for a hydrogen atom, with bromine,—dehydrohalogenating the resulting dibromo compound of formula V,



V

wherein R is identical with R^1 as defined above, except where R^1 stands for hydrogen.

4,544,741

AZOLE DINUCLEOTIDE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Roland K. Robins, 4006 Sherwood, Provo, Utah 84604, and Ganapathi R. Revankar, 1003 N. 560 East St., Orem, Utah 84057

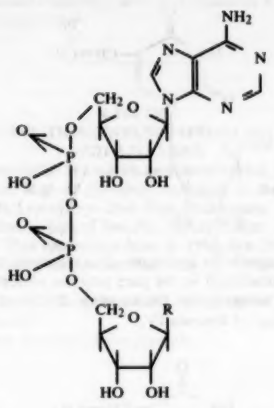
Filed Mar. 29, 1982, Ser. No. 363,315

Int. Cl.⁴ C07H *19/20*

U.S. Cl. 536—27 **7 Claims**

1. Azolecarboxamide adenosine dinucleotide compounds having the structural formula:

I



and the pharmaceutically acceptable salts of the compounds; wherein R is a heterocycle that is 3-carbamoyl-1,2,-4-triazol-1-yl or 4-carbamoylselenazol-2-yl.

4,544,742

1,2,6-THIADIAZINE-3,5-DIONE-1,1-DIOXIDES

Werner Schmitt, Prinzenweg 10; Robert Purrmann, Riemerschmidstrasse 18, both of D-813 Starnberg; Peter Jochum, Pointweg 5, D-8031 Hechendorf; Heinz-Joachim Hübner, Moosbichleg 16, D-8031 Wörthsee/Steinebach, and Bernd Burger, Hirtenweg 4a, D-8031 Hechendorf, all of Fed. Rep. of Germany

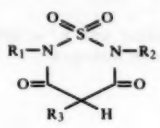
Division of Ser. No. 349,769, Feb. 18, 1982, Pat. No. 4,443,587. This application Feb. 28, 1984, Ser. No. 573,391

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107577

Int. Cl.[4] C07D *285/16*

U.S. Cl. 544—8 **10 Claims**

1. A compound of the formula:



wherein

R_1 and R_2 independently are

C_1–C_{18} alkyl,

C_1–C_{18} alkyl substituted by C_1–C_5 alkoxy, halogen, C_1–C_5 alkoxycarbonyl, or C_4–C_7 cycloalkyl,

C_3–C_5 alkenyl, or

C_4–C_7 cycloalkyl, substituted by C_1–C_4 alkyl, halogen, or C_1–C_4 alkoxy, and

R_3 is C_1–C_{18} alkyl,

C_1–C_{18} alkyl, substituted by C_1–C_5 alkoxy, halogen, C_1–C_5 alkoxycarbonyl, or C_4–C_7 cycloalkyl, phenyl, or naphthyl,

C_3–C_5 alkenyl, or

C_4–C_7 cycloalkyl, substituted by C_1–C_4 alkyl, halogen, or C_1–C_4 alkoxy.

4,544,743

SALTS OF 1,3,5-OXADIAZINES-2,4,6-TRIONES, 1,3,5-OXADIAZINES-2,4,6-TRIONES AND THE PREPARATION THEREOF

Pierre M. Lambert, Louvain-la-Neuve, and Ignacio De Aguirre-Otegui, Wavre-Limal, both of Belgium, assignors to Societe Carbochimique, Brussels, Belgium

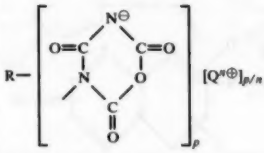
Filed Jun. 27, 1983, Ser. No. 507,637

Claims priority, application Luxembourg, Jun. 29, 1982, 84242

Int. Cl.[4] C07D *273/04*

U.S. Cl. 544—64 **33 Claims**

1. A 1,3,5-oxadiazine-2,4,6-trione salt of the following formula (I):



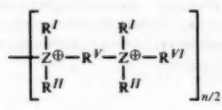
(I)

in which

R represents a monovalent, divalent or trivalent alkyl, alkylene, cycloalkyl or arylalkyl radical containing at most 18 carbon atoms;

Q represents a mono-, bi- or trivalent metal or a group containing a number n of unsubstituted or mono-, di-, tri-, or tetrasubstituted ammonium, phosphonium or arsonium radicals selected from the group consisting of the radicals of the formulae:

$(R^{I}R^{II}R^{III}Z)_nR^{14}$, and (V)



(VI)

in which n has the meaning given hereafter, Z represents nitrogen, phosphorus or arsenic, R^{I}, R^{II}, R^{III} and R^{IV}, which are identical or different, represent hydrogen, an alkyl, an aryl or arylalkyl radical containing 1 to 12 atoms, whereby R^{IV} may also represent a bivalent alkylene radical containing 4 to 6 carbon atoms and two or three atoms of R^{I}, R^{II}, R^{III} and R^{IV} may also be joined with one or two nitrogen atoms to form a di-lower alkyl piperidinium group, a lower alkyl pyridinium group or a di-lower alkyltriethylene diammonium group;

R^{V} and R^{VI}, which are identical or different, represent a lower alkylene, lower cycloalkylene or phenylene di-lower alkylene radical;

p is an integer which is equal to 1 to 3 inclusive, and

n, represents the oxidation number of the metal or the number of ammonium, phosphonium or arsonium functions present in the Q group and is equal to 1 to 40.

4,544,744

PROCESS FOR PREPARING 3,4,6-TRISUBSTITUTED 3-ALKYLTHIO-1,2,4-TRIAZIN-5-ONE DERIVATIVES

Thomas Schmidt, Haan, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

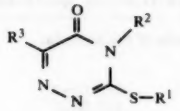
Filed Oct. 30, 1984, Ser. No. 666,420

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339859

Int. Cl.[4] C07D *253/06*

U.S. Cl. 544—182 **13 Claims**

1. A process for preparing a 3,4,6-trisubstituted 3-alkylthio-1,2,4-triazin-5-one of the formula



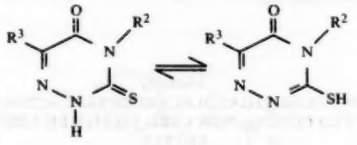
in which

R^1 is alkyl, alkenyl, alkynyl, optionally substituted cycloalkyl or optionally substituted aralkyl,

R^2 is amino, alkylamino or alkyl, and

R^3 is alkyl, halogenoalkyl, alkoxyalkyl, optionally substituted cycloalkyl, optionally substituted aryl or optionally substituted aralkyl,

which comprises reacting a 3-mercapto-1,2,4-triazin-5-one of the formula



with an ester of an oxygen-containing acid as an alkylating agent, the reaction being effected at a temperature between about −20° and 180° C. in the presence of an at least equimolar amount of a strong oxygen-containing acid.

4,544,745

CIS-4A-ARYL, 1, 2, 3, 4, 4A, 9B-HEXAHYDRO-BENZOFURO-[3,2-C]- PYRIDINES USEFUL AS ANALGESICS

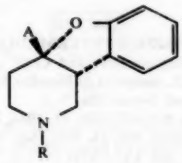
Solomon S. Klioze, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 400,576, Jul. 22, 1982, Pat. No. 4,507,306. This application Dec. 21, 1984, Ser. No. 685,261

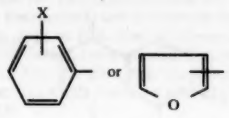
Int. Cl.[4] C07D *491/048*

U.S. Cl. 546—89 **16 Claims**

1. A compound of the formula



wherein A is



X being hydrogen, halogen, methyl, methoxy or hydroxyl, halogen being fluorine, chlorine, bromine or iodine; and R is ethyoxycarbonyl, cyanoloweralkyl, phenylcarbonylloweralkyl, phenoxyloweralkyl, phenylacetyl or cycloalkylcarbonyl where the carbonyl group of the phenylcarbonylloweralkyl may be in the ethylene ketal form; and the phenyl or phenoxy group in said phenylcarbonyloweralkyl, phenoxyloweralkyl or phenylacetyl group may have a halogen attached thereto and a pharmaceutically acceptable acid addition salt of any of the foregoing.

4,544,746

PROCESS FOR PREPARING 2-ANILINOACRIDONE

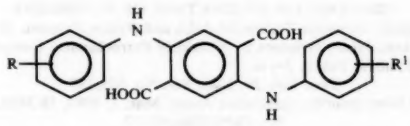
Wilfried G. Höltje, Wilmington, Del., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 17, 1982, Ser. No. 378,802

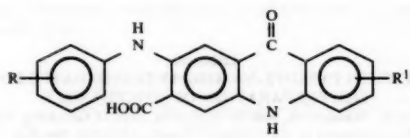
Int. Cl.[4] C07D *219/06, 219/08;* C09B *48/00*

U.S. Cl. 546—103 **3 Claims**

1. A process comprising dissolving at from about 40° C. to about 60° C. a compound of the formula



wherein R and R^1 are —H, —Cl, C_{1-4} alkyl or C_{1-4} alkoxy, in a mixture of 50 to 75 volume percent polyphosphoric acid and 50 to 25 volume percent phosphoric acid, calculated as 85% aqueous phosphoric acid, heating the solution to 100° to 120° C. for 5 to 90 minutes and recovering a compound of the formula



4,544,747

QUINOLINE CARBOXYLIC ACID DERIVATIVES

Hiroshi Ishikawa; Fujio Tabasa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Japan

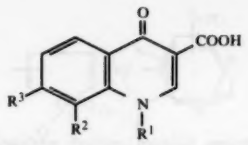
Continuation of Ser. No. 342,200, Jan. 25, 1982, abandoned, which is a continuation of Ser. No. 123,256, Feb. 20, 1982, abandoned. This application Apr. 27, 1984, Ser. No. 604,574

Claims priority, application Japan, Feb. 26, 1979, 54-22162

Int. Cl.[4] C07D *217/24*

U.S. Cl. 546—156 **3 Claims**

1. A quinoline carboxylic acid derivative represented by the formula



wherein R^1 is ethyl, R^2 is methyl and R^3 is chlorine or fluorine and its pharmacologically or agrochemically acceptable salt.

4,544,748

INTERMEDIATES FOR MEFLOQUIN

Solange Adam-Molina, St. Louis, France, assignor to Hoffmann-La Roche Inc., Nutely, N.J.

Filed Aug. 22, 1983, Ser. No. 525,341

Claims priority, application Switzerland, Sep. 10, 1982, 5393/82

Int. Cl.⁴ C07D *405/14, 405/06*

U.S. Cl. 546—167 **2 Claims**

1. N-[4-{3-<2,8-Bis-(trifluoromethyl)-4-quinolyl>-2-oxiranyl}-butyl]-phthalimide.

2. N-[6-<2,8-Bis-(trifluoromethyl)-4-quinoiyi>-5-hexenyl]-phthalimide.

4,544,749

PROCESS FOR PRODUCTION OF PIPERIDINE

Tadashi Ayusawa; Tadamichi Aoki, and Ryozo Hamana, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,237

Claims priority, application Japan, Mar. 2, 1983, 58-34012

Int. Cl.⁴ C07D *295/02*

U.S. Cl. 546—184 **12 Claims**

1. A process for producing piperidine by catalytic hydrogenation in a liquid-phase of a starting amine selected from the group consisting of furfurylamine, tetrahydrofurfurylamine and mixtures thereof, characterized in that the catalyst used is a cobalt-based catalyst and in that the starting amine is in a state of dilution with an organic solvent.

4,544,750

CERTAIN PYRIDYL-N-OXIDE INTERMEDIATES FOR THE PREPARATION OF OMEPRAZOLE

Arne E. Brändström, and Bo R. Lamm, both of Göteborg, Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

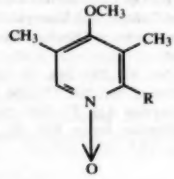
Filed Aug. 26, 1983, Ser. No. 526,900

Claims priority, application Sweden, Aug. 26, 1982, 8204879

Int. Cl.⁴ C07D *213/68*

U.S. Cl. 546—290 **3 Claims**

1. A compound of the formula



wherein R is H or CH_3.

4,544,751

THIADIAZOLE DERIVATIVES

Takao Takaya, Sakai; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, Nara, and Zenzaburo Tozuka, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 206,299, Nov. 12, 1980, Pat. No. 4,350,693, which is a division of Ser. No. 26,779, Apr. 3, 1979, Pat. No. 4,263,291, which is a continuation-in-part of Ser. No. 839,974, Oct. 6, 1977, abandoned. This application Jul. 9, 1982, Ser. No. 396,643

Claims priority, application United Kingdom, Oct. 8, 1976, 42057/76

Int. Cl.⁴ C07D *285/06, 285/12;* **A61K** *31/425*

U.S. Cl. 548—127 **3 Claims**

1. The compounds of the formula:

wherein

R^1 is 1,2,3-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,5-thiadiazolyl or isothiazol-4-yl, each of which may be substituted with lower alkyl, or thiazolyl;

$R^{2'}$ is hydrogen, lower alkyl or a hydroxy protective group; and

Z' is carboxy or protected carboxy, and soluble and non-toxic salts thereof.

4,544,752

3-ARYL-5-ISOTHIAZOLECARBOXYLIC ACIDS AND RELATED COMPOUNDS USED TO LOWER URIC ACID LEVELS

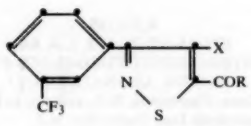
James R. Beck; Robert P. Gajewski, both of Indianapolis, and Ronald E. Hackler, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 368,076, Apr. 14, 1982, abandoned, which is a division of Ser. No. 189,435, Sep. 22, 1980, Pat. No. 4,346,094. This application Jun. 6, 1983, Ser. No. 501,234

Int. Cl.⁴ C07D *275/02*

U.S. Cl. 548—214 **8 Claims**

1. A compound of the formula



wherein X is NH_2, OH, hal, H or NHalk; and R is OH or OM; wherein hal is Cl, Br, I or F; alk is (C_1–C_3) alkyl and M is a non-toxic cation.

4,544,753

ISOXAZOLE INTERMEDIATES

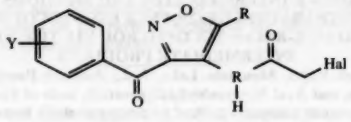
John J. Tegeler, Bridgewater, and Craig J. Diamond, Budd Lake, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 615,857, May 31, 1984, Pat. No. 4,514,410. This application Jan. 14, 1985, Ser. No. 691,314

Int. Cl.⁴ C07D *261/14*

U.S. Cl. 548—245 **7 Claims**

1. The compound having the formula



wherein Y is halogen, trifluoromethyl, lower alkyl, lower alkoxy and hydrogen; R is lower alkyl; and Hal is a halogen.

4,544,754

PREPARATION OF IMIDAZOLINYL BENZOIC ACIDS, ESTERS AND SALTS

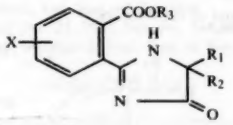
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 74,940, Sep. 13, 1979, Pat. No. 4,297,128, which is a division of Ser. No. 914,244, Jun. 9, 1978, Pat. No. 4,188,487, which is a continuation-in-part of Ser. No. 822,458, Aug. 8, 1977, abandoned. This application Jul. 2, 1981, Ser. No. 279,886

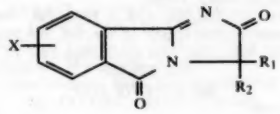
Int. Cl.[4] C07D *233/70*

U.S. Cl. 548—301 **3 Claims**

1. A method for the preparation of a compound having the formula:



wherein X is hydrogen, alkyl C_1–C_3, halogen or nitro; R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, phenyl, halophenyl or benzyl or when R_1 and R_2 are taken together with the carbon to which they are attached they may represent cycloalkyl C_3–C_6 optionally substituted with methyl; R_3 is, alkyl C_1–C_{12} optionally substituted with one C_1–C_3 alkoxy group or one C_3–C_6 cycloalkyl group or one phenyl group or one furyl group, alkenyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituent(s) alkynyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituent(s), benzyl, cyclohexenylmethyl, ethynylcyclohexyl, ethynylalkyl or pentadienyl, cycloalkyl, C_3–C_6 optionally substituted with one or two C_1–C_3 alkyl group(s); and when R_1 and R_2 are not the same the optical isomers thereof, and the isomeric mixtures thereof; comprising, reacting a compound having the formula:



wherein X, R_1 and R_2 are as described above, which an alcohol having the formula: R_3OH where R_3 is described above, in the presence of an alkali metal or alkali metal hydride and at a temperature between about 20° C. and 50° C.

4,544,755

CLEAVAGE OF PHTHALIMIDES TO AMINES

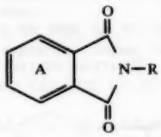
Helmut Hagen, Frankenthal, and Rolf-Dieter Kohler, Edingen-Neckarhausen, both of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,227

Int. Cl.[4] C07D *233/58*; C07C *85/20*

U.S. Cl. 548—335 **13 Claims**

1. A process for the cleavage of a phthalimide of the formula I



to produce H_2N—R;

wherein R is an aliphatic, cycloaliphatic, aromatic or heterocyclic group, and ring A is either unsubstituted or independently substituted by chlorine, bromine, nitro, carboxyl, carbamyl or sulfamyl;

wherein the compound of formula I is treated with an alkanol amine.

4,544,756

ZWITERIONIC 2-ALKYL IMIDAZOLINES AS EMULSIFYING AGENTS FOR OIL BASED DRILLING FLUIDS

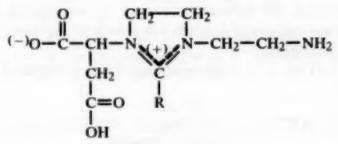
Arvind D. Patel, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 17, 1983, Ser. No. 552,641

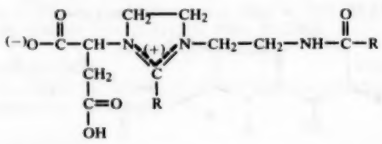
Int. Cl.[4] C07D *233/18*

U.S. Cl. 548—354 **7 Claims**

1. Zwiterionic 2-alkyl imidazoline selected from the group consisting of



1-(2'-aminoethane)-2-alkyl-3-succinyl imidazole salt, and



1-2'-akylamido ethane)-2-alkyl-3-succinyl imadzole salt; wherein R is an alkyl radical containing 12 to 22 carbon atoms.

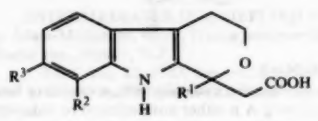
4,544,757

PROCESS FOR THE RESOLUTION OF PYRANO[3,4-B]INDOLE-1-ACETIC ACIDS

Christopher A. Demerson, Plainsboro, and Leslie G. Humber, North Brunswick, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 16, 1984, Ser. No. 580,901
Int. Cl.[4] C07D *495/04*
U.S. Cl. 548—432 **8 Claims**

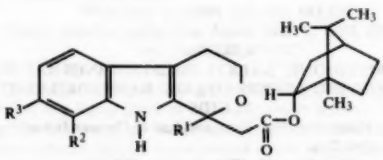
1. A process for resolving a racemic (±)-compound of formula I



(I)

in which R^1 is lower alkyl, and R^2 and R^3 each is hydrogen, lower alkyl or halo to obtain the corresponding (+) or (−)-enantiomer of formula I in which R^1, R^2 and R^3 are as defined herein, which comprises:

(a) esterifying a racemic (±)-compound of formula I in which R^1, R^2 and R^3 are as defined herein with (−)-borneol to obtain a diastereoisomeric mixture of a corresponding compound of formula II



(II)

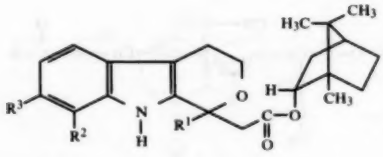
in which R^1, R^2 and R^3 are as defined herein;

(b) separating the diastereoisomers;

(c) hydrolyzing the diastereoisomers of formula II in which R^1, R^2 and R^3 are as defined herein with an aqueous alkaline solution; and

(d) isolating the substantially pure corresponding (+) or (−)-enantiomer of formula I in which R^1, R^2 and R^3 are as defined herein.

7. A (+) or (−)-diastereoisomer of a compound of the formula



in which R^1 is lower alkyl, and R^2 and R^3 each is hydrogen, lower alkyl or halo.

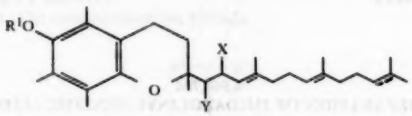
4,544,758

VITAMIN E INTERMEDIATES AND METHODS FOR THE PREPARATION OF (2R,4'RS,8'RS)-α-TOCOPHEROL AND (ALL-RAC)-α-TOCOPHEROL VIA THE NEW INTERMEDIATE PRODUCTS

Friedrich Vogel, Mountain Lake, N.J.; Joachim Paust, Neuhofen, and Axel Nuerrenbach, Gruenstadt, both of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,802
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—407 **4 Claims**

1. A compound having the general formula



in which R^1 is H, an alkyl, phenylalkyl or acetyl radical; Y is OH, X is H; and the dotted line indicates that the compound may have an additional double bond at the 11' position.

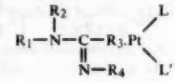
4,544,759

PLATINUM COMPLEXES OF ANTITUMOR AGENTS

Joseph J. Hlavka, Tuxedo; Panayota Bitha, Pomona, and Yang-i Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 29, 1983, Ser. No. 518,730
Int. Cl.[4] C07F *15/00*; A01N *55/02*; A61K *31/28*
U.S. Cl. 556—36 **16 Claims**

1. A compound of the formula:



wherein R_1 is amino, benzyl, cyano, $—CONH_2$ or $—N{=}C(CH_3)_2$; R_2 is hydrogen or alkyl(C_1–C_3); R_3 is amino, hydrazino, dialkylamino(C_1–C_3), nitroamino, alkyl(C_1–C_3), phenyl, p-chlorophenyl, p-methoxyphenyl, phenylamino, benzylamino, alkylamino(C_1–C_3), alkylthio(C_1–C_3), diphenylamino or $—NH(CH_2)_nN(CH_3)_2$ where n is an integer 2–4; R_4 is hydrogen or benzyl; and L and L' are the same and are anions selected from the group consisting of halide, nitrate, sulfate and (C_2–C_6)alkanoate or L and L' taken together is a dibasic anion selected from the group consisting of oxalate, malonate, methylamalonate, ethylmalonate, succinate, tartronate, 1,1-cyclopropane dicarboxylate and 1,1-cyclobutane dicarboxylate.

4,544,760

REACTION PRODUCTS OF A DIFUNCTIONAL COMPOUND AND AN ORGANO TITANATE

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 402,981, Aug. 3, 1982, Pat. No. 4,444,957, which is a continuation-in-part of Ser. No. 106,502, Dec. 26, 1979, Pat. No. 4,351,926. This application Feb. 17, 1984, Ser. No. 579,402
Int. Cl.[4] C07F *7/28*
U.S. Cl. 556—40 **18 Claims**

1. A cross-linking agent, suitable for cross-linking an alkylene-alkyl acrylate copolymer to a cross-linked product, which is the reaction product of a mixture containing a difunctional compound which can be 1,5-pentanediol diacetate, a compound having the formula $HO—CH_2—CH_2—S—CH_2—CH$-

$_2$—OH, or a compound falling within the scope of the formula HO—CH_2—OH selected from the group consisting of decanediol and dodecanediol; and from 5 to 100 parts by weight, based on 100 parts by weight of the dihydroxy compound, of an organo titanate.

4,544,761

PHARMACEUTICAL COMPOUND ZINC GLYCEROLATE COMPLEX PREPARED BY REACTING ZINC OXIDE AND GLYCEROL

Reginald M. Taylor, 48 Denning St., Hawthorn, State of South Australia 5062, and Alan J. Brock, 26 Strangways Ter., North Adelaide, State of South Australia, both of Australia

PCT No. PCT/AU81/00164, § 371 Date Jul. 20, 1982, § 102(e) Date Jul. 20, 1982, PCT Pub. No. WO82/01867, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 18, 1981, Ser. No. 403,636

Int. Cl.[4] C01F *3/06*

U.S. Cl. 556—130 **24 Claims**

1. A pharmaceutical compound formed by the process of reacting zinc oxide with glycerol by raising the temperature to about 260° C. and maintaining the temperature until reaction is completed to form $C_3H_6O_3Zn$, cooling the reaction mixture and pouring the zinc glycerolate slurry so formed into water, adding copper to the said slurry and shaking to cause zinc to be replaced by the said copper, and filtering the residue and washing and drying to produce a modified zinc glycerolate complex.

4,544,762

PROCESS FOR THE PREPARATION OF OLIGOMERIC ALUMINOXANES

Walter Kaminsky, Pinneberg, and Heinrich Hähnsen, Delingsdorf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

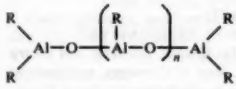
Filed Oct. 31, 1983, Ser. No. 546,862

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240383

Int. Cl.[4] C07F *5/06*

U.S. Cl. 556—179 **12 Claims**

1. A process for the preparation of oligomeric, linear and/or cyclic alkylaluminoxanes of the formulae:



for a linear aluminoxane and

for a cyclic aluminoxane

in which n=2 to 40 and R=C_1–C_6-alkyl, which comprises reacting, with the elimination of an alkane, an aluminum trialkyl dissolved in an inert aliphatic or aromatic solvent at temperatures between −20° and 100° C. with an aluminum salt containing water of crystallization.

4,544,763

POLYISOCYANATE BINDER HAVING LOW TOLUENE DIISOCYANATE CONTENT

Thirumurti Narayan, Grosse Ile, Mich., assignor to Basf Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 19, 1984, Ser. No. 662,934

Int. Cl.[4] C07C *125/06, 119/048*

U.S. Cl. 560—26 **5 Claims**

1. A polyisocyanate composition having a free monomeric toluene diisocyanate content of less than one percent by weight prepared by first reacting (a) a hydroxyl-terminated polyoxyalkylene compound having an equivalent weight of from about 800 to about 1200 with (b) toluene diisocyanate at an NCO to OH equivalent ratio of from about 1.1 to about 1.5 to obtain an intermediate product having an NCO content of about 2.1 to about 2.6 percent by weight and thereafter reacting the intermediate product with (c) about 3.0 to about 5.0 equivalents of diphenylmethane diisocyanate per equivalent of (a) for an additional 0.5 hour to 2.0 hours at from 75° C. to 85° C.

4,544,764

INTERPHENYLENE CARBACYCLIN COMPOUND

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 18, 1984, Ser. No. 631,977

Claims priority, application Japan, Jul. 18, 1983, 58-111290[U]; Dec. 26, 1983, 58-203171[U]

Int. Cl.[4] C07C *177/00*

U.S. Cl. 560—56 **1 Claim**

1. The compound 15-cyclohexyl-9-deoxy-13,14-dihydro-2′,9α-methano-3-oxa-4,5,6,16,17,18,19,20-octanor-3,7(1′,3-interphenylene)PGF_1 and pharmacologically acceptable salts thereof.

4,544,765

CHLORAMPHENICOL DERIVATIVES

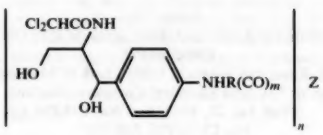
Pyare Khanna, San Jose; Evan S. Snyder, Mountain View, and Prithipal Singh, Sunnyvale, all of Calif., assignors to Syra Company, Palo Alto, Calif.

Division of Ser. No. 256,761, Apr. 23, 1981, Pat. No. 4,489,156. This application Nov. 30, 1984, Ser. No. 676,689

Int. Cl.[4] C07C *87/64, 101/44*

U.S. Cl. 560—29 **5 Claims**

1. A compound of the formula:



wherein:

R is an aliphatic linking group of up to 12 atoms other than hydrogen having a chain of from 2 to 8 atoms comprised of carbon, nitrogen, and chalcogen of atomic no. 8 to 16;

Z is hydrogen, hydroxyl, alkoxyl of from 1 to 6 carbon atoms, a group forming an activated ester capable of amide formation in an aqueous medium, or a poly(amino acid) which is antigenic or an enzyme;

m is 0 or 1, when Z is a poly(amino acid) and is otherwise 1; and

n is 1 when Z is other than a poly(amino acid) and is otherwise 1 to the molecular weight of Z divided by 1000.

4,544,766

PROCESS FOR PREPARING ARYL ACETIC ACID DERIVATIVES

Tatsuya Shono, Kyoto, Japan, assignor to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Feb. 26, 1982, Ser. No. 352,546

Claims priority, application Japan, Mar. 6, 1981, 56-33007; Sep. 21, 1981, 56-150132; Feb. 22, 1982, 57-27962

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—75 **3 Claims**

1. A process for preparing an aryl acetic acid derivative represented by the formula

$$Ar(CH_2COY)_n$$

wherein Ar is phenyl, polynuclear aromatic group or hetero-

cyclic group optionally substituted with halogen, hydroxyl, alkyl, alkenyl, aralkyl, alkoxy, acyloxy, aralkyloxy or phenoxy having or having not substituents, the substituent of said Ar is 1 to 3 in number and may be different or the same, n is an integer of 1 to 3, and Y is hydroxyl, or alkoxy, the process comprising hydrolyzing a dichloroethenyl compound represented by the formula

$$Ar(CH{=}CCl_2)_n$$

when Ar and n are defined as above in the presence of about 0.01 to about 10 mole alkaline substance per mole of the dichloroethenyl compound in water and an organic solvent selected from the group consisting of methanol, ethanol and like alcohols, dimethylformamide, dimethylsulfoxide, dioxane, tetrahydrofuran and like ethers, benzene, toluene and like aromatic hydrocarbons or a mixture thereof, said alkaline substance being selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides and alkali metal alkoxides.

4,544,767

DIACYLOXYOLEFINS ARE HYDROGENATED IN PRESENCE OF ALKALI AND ALKALINE EARTH METAL SALTS OF CARBOXYLIC ACIDS

Kiplin D. Cowan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 1, 1980, Ser. No. 174,425

Int. Cl.⁴ C07C *67/283*

U.S. Cl. 560—263 **7 Claims**

1. The hydrogenation of an acyloxyolefin in the presence of about 1–50 wt.% based on the amount of olefin present, of at least one of an alkali and an alkaline earth metal salt of a carboxylic acid.

4,544,768

REDUCTION OF ACRYLAMIDE AND ACRYLONITRILE EMISSIONS

William R. Knee, and Sergio S. Cutié , both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1984, Ser. No. 634,238

Int. Cl.⁴ C07C *103/133*

U.S. Cl. 564—206 **6 Claims**

1. A method for preventing polymerization of aqueous acrylamide contained in a vessel comprising passing an oxygen-containing gas through the aqueous acrylamide containing acrylonitrile and then contacting the resulting gas stream solely with a carbon adsorbent.

4,544,769

PROCESS FOR THE PREPARATION OF COMPACT NITROGUANIDINE

Walter Engel, Pfinztal-Berghausen, and Herbert Heinisch, Ettlingen, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 970,140, Dec. 18, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 184,912

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756335

Int. Cl.⁴ C07C *129/12*

U.S. Cl. 564—242 **26 Claims**

1. Process for the preparation of nitroguanidine having a high bulk density and a globular form from a hot saturated solution of nitroguanidine in a solvent, said hot saturated solution being at a starting temperatue of 80° C.–150° C., comprising cooling the hot saturated solution of nitroguanidine in a solvent from said starting temperature while being agitated, whereby nitroguanidine, having a high bulk density and a globular form, is crystallized from a strong supersaturation of the solution, wherein the solvent is selected from the group consisting of polyhydric lower aliphatic alcohols, mono- or dialkyl ethers of the polyhydric lower aliphatic alcohols, dimethylformamide, dimethyl sulfoxide, or mixtures thereof, the solution is cooled at a temperature gradient of more than 3° C./minute, and the solvent, the starting temperature, and the coolant temperature are selected such that crystallization of the nitroguanidine from the solution occurs only at temperatures of below 50° C., to provide crystallization from a strong supersaturation of said solution.

4,544,770

CATALYTIC HYDROGENATION

Emil A. Broger, Magden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

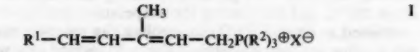
Filed Jul. 11, 1983, Ser. No. 512,845

Claims priority, application Switzerland, Jul. 16, 1982, 4359/82; May 16, 1983, 2637/83

Int. Cl.⁴ C07F *9/54*

U.S. Cl. 568—9 **24 Claims**

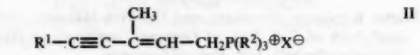
1. A process for producing a compound of the formula:



I

wherein R^1 is 2,6,6,-trimethyl-1-cyclohexen-1-yl or 2,3,6-trimethylphenyl, either of which is unsubstituted or substituted with hydroxy or a protected hydroxy group; R^2 is aryl and $X^{\ominus}$ is an anion,

which process comprises selectively hydrogenating a compound of the formula:



II

wherein R^1, R^2 and $X^{\ominus}$ are as above,

said compounds I and II being in any of their various cis and trans sterioisomeric forms and mixtures thereof, in an organic solvent in the presence of a catalyst which is a metal or metal compound, said metal being nickel, palladium, platinum, cobalt, rhodium, iridium or ruthenium.

4,544,771

HALOGENOBIPHENYL DERIVATIVES

Michael Römer, Rodgau; Joachim Krause, Dieburg, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

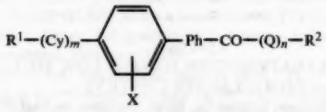
Division of Ser. No. 472,307, Mar. 4, 1983, Pat. No. 4,505,838. This application Feb. 8, 1985, Ser. No. 699,898

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208089

Int. Cl.⁴ C07C *49/813, 69/76*

U.S. Cl. 568—329 **14 Claims**

1. A halogenobiphenyl derivative of the formula



wherein R^1 and R^2 are each alkyl or alkoxy each of 1–10 C atoms; Cy is 1,4-cyclohexylene; Ph is 1,4-phenylene; Q is —O—Cy— or —O—Ph; m and n are each 0 or 1; and X is F, Cl or Br,

with the proviso that when R^1 is alkoxy, R^2 is alkyl and m and n are both 0, then X is not Br; and when R^1 and R^2 are both alkoxy and m and n are both 0, then X is not F or Cl.

4,544,772

METHOD OF PURIFYING HEXAFLUOROACETONE HYDRATE

Mithio Sawai; Yoshihiro Tasaka, both of Kamifukuoka; Toshikazu Kawai, and Yutaka Katsuhara, both of Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 27, 1984, Ser. No. 604,536
Claims priority, application Japan, Apr. 30, 1983, 58-74924
Int. Cl.[4] C07C *45/80*
U.S. Cl. 568—411 5 Claims

1. A method of purifying crude hexafluoroacetone hydrate which is practically free of hydrogen halides and contains at least one chlorofluoroacetone hydrate as impurity, the method comprising the steps of:

(a) adding an alkali metal hydroxide to the crude hexafluoroacetone hydrate and maintaining the resultant mixed solution at an elevated temperature in the range of from about 100° C. to about 110° C. to thereby cause a preferential decomposition reaction of said at least one chlorofluoroacetone hydrate with said alkali metal hydroxide, wherein the mole ratio of said alkali metal hydroxide to the total of said at least one chlorofluoroacetone hydrate is in the range of from 4:1 to 10:1, and said alkali metal hydroxide amounts to 30–70 mole% of the total organic matter in the crude hexafluoroacetone hydrate;

(b) neutralizing an excess portion of said alkali metal hydroxide by adding a mineral acid to the reaction liquid after step (a) to thereby prevent decomposition of the hexafluoroacetone hydrate; and

(c) recovering purified hexafluoroacetone hydrate from the reaction liquid after step (b).

4,544,773

PROCESS FOR PRODUCING FORMALDEHYDE

Masakazu Sagou, Osaka, Japan, assignor to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,327
Claims priority, application Japan, Jun. 23, 1983, 58-113837; Jun. 23, 1983, 58-113838
Int. Cl.[4] C07C *47/04*
U.S. Cl. 568—487 17 Claims

1. A process for producing formaldehyde which comprises dehydrogenating methanol in a gaseous atmosphere in the absence of oxygen and in the presence of a metal oxide catalyst obtained by baking a nitrate or organic salt of zinc, indium or of both zinc and indium at a temperature of at least 400° C.

4,544,774

PROCESS FOR REDUCING COLOR IN POLY(TETRAMETHYLENE ETHER) GLYCOL

Rudolph Pick, Dordrecht, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1984, Ser. No. 678,681
Int. Cl.[4] C07C *41/34*
U.S. Cl. 568—617 2 Claims

1. In the process of preparing poly(tetramethylene ether)-glycol by the catalytic polymerization of tetrahydrofuran using fluosulfonic acid as the catalyst, a method of reducing color formation which comprises using fluosulfonic acid which contains 2–1000 ppm of aluminum.

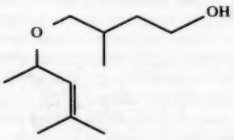
4,544,775

ETHER CARBINOLS, PROCESS FOR PREPARING SAME, PRODUCTS PRODUCED ACCORDING TO SAID PROCESSES CONTAINING SAID ETHER CARBINOLS, ORGANOLEPTIC USES THEREOF, ETHER CARBOXALDEHYDES AND ORGANOLEPTIC USES THEREOF

Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 574,150, Jan. 26, 1984, , which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, , which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Aug. 24, 1984, Ser. No. 644,059
Int. Cl.[4] C07C *43/15;* A61K *7/46;* C11B *9/00*
U.S. Cl. 568—675 1 Claim

1. The ether carbinol having the structure:

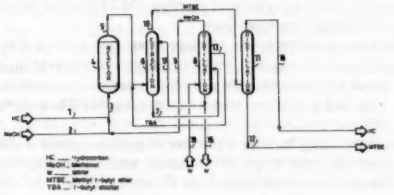


4,544,776

PROCESS FOR SEPARATING METHANOL FROM THE REACTION PRODUCTS OBTAINED IN THE ETHERIFICATION OF C_4 THROUGH C_7 ISOOLEFINS WITH METHANOL

Günther Osterburg, Duisburg, and Milan Prezelj, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,707
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150755
Int. Cl.[4] C07C *41/38, 41/42*
U.S. Cl. 568—697 7 Claims



1. The process for separating methanol from the reaction products of the etherification of C_4–C_7 isoolefins with methanol which comprises

washing the etherification reaction products at 20° C.–60° C., immediately after etherification, with water in the presence of inert hydrocarbons and a recycle stream containing a high concentration of a tertiary alcohol thereby forming (i) a raffinate and (ii) an aqueous extract bottoms containing alcohols including methanol and the tertiary alcohol in said washing operation;

maintaining a methanol:water weight ratio of 1:1.5 to 1:10 in said washing operation;

passing said aqueous extract bottoms to a distillation column;

distilling said aqueous extract bottoms in said distillation column thereby forming distillation overhead containing methanol;

withdrawing a side stream containing the tertiary alcohol from a tray of said distillation column containing a high concentration of the tertiary alcohol; and

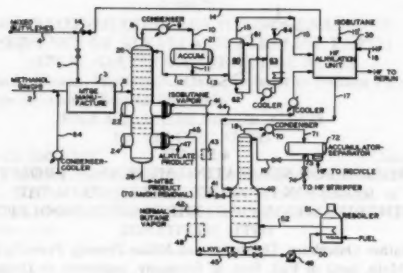
passing said withdrawn side stream as said recycle stream to said washing operation.

4,544,777

COMBINATION ALKYLATION-ETHERIFICATION PROCESS

Tom Hutson, Jr., Galveston, Tex., and Paul D. Hann, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1984, Ser. No. 664,194
Int. Cl.[4] C07C *41/05*
U.S. Cl. 568—697 **6 Claims**



1. A combination energy efficient process for producing high quality and gasoline blending components which comprises the steps of

(a) contacting a mixture of methanol and an olefinic C_4 cut comprising isobutene, isobutane and at least one normal butene under isobutene etherification conditions to produce methyl tertiarybutyl ether (MTBE) and unreacted C_4 olefinic hydrocarbons,

(b) passing the reaction effluent from step (a) to a fractionation zone operated under conditions to recover an overhead stream comprising normal butenes and some methanol, and a bottom stream comprising MTBE and methanol,

(c) contacting at least a portion of said overhead stream in step (b) with isoparaffin and an acid alkylation catalyst under alkylation conditions in a alkylation zone to produce a hydrocarbon fraction comprising alkylate, normal butane, isobutane, and propane and lighter materials,

(d) passing the hydrocarbon reaction effluent from alkylation in step (c) to a fractionation zone operated under conditions sufficient to recover an overhead stream comprising propane and lighter hydrocarbons, a first intermediate vaporous stream comprising isobutane, a second intermediate vaporous stream comprising normal butane, and a bottom stream comprising substantially liquid alkylate product,

(e) passing said bottom stream in step (d) directly without substantial cooling to indirect heat exchange through boiling zone in a lower portion of said fractionation zone in step (b) as a source of reboiler heat for said fractionation zone, and

(f) passing said intermediate vaporous stream comprising isobutane in step (d) through an intermediate heat exchange zone positioned in said fractionation zone in step (b) to condense said isobutane and release heat as an additional source of heat for said fractionation zone.

4,544,778

BULK SEPARATION OF SORBITOL BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES

Chien C. Chao, Millwood, and John D. Sherman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 457,427, Jan. 12, 1983, Pat. No. 4,482,761, which is a continuation-in-part of Ser. No. 417,577, Sep. 13, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,215
Int. Cl.[4] C07C *29/76, 31/26, 35/16*
U.S. Cl. 568—872 **6 Claims**

1. A process for separating sorbitol from a solution of a carbohydrate mixture also containing inositol by selective adsorption which comprises contacting said solution at a temperature of from about 0° C. to 150° C. and at a pressure sufficient to maintain the system in the liquid phase with an adsorbent composition comprising at least one crystalline aluminosilicate zeolite selected from the group consisting of zeolite type Y and zeolite type X in which the zeolite cations in association with at least 50% of the AlO_4 tetrahedra of said aluminosilicate are calcium, whereby the sorbitol is selectively adsorbed thereon, removing the non-adsorbed portion of said solution from contact with the zeolite adsorbent, and desorbing the sorbitol therefrom by contacting said adsorbent with a desorbing agent and recovering the desorbed sorbitol.

4,544,779

EXTRACTION OF ALCOHOLS WITH PHOSPHINE OXIDES

John H. Bright, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1984, Ser. No. 595,843
Int. Cl.[4] C07C *29/86, 31/08, 31/12*
U.S. Cl. 568—918 **11 Claims**

1. A method for recovering lower alcohols from aqueous solutions thereof in some concentrated form which comprises contacting an aqueous solution containing an alcohol having from 2–4 carbon atoms, inclusive, and a weight ratio of acid to alcohol of less than 0.1 with a sufficient amount of a phosphine oxide having the formula

$$R_3P{=}O$$

wherein each R, individually, is an alkyl radical of 4–18 carbon atoms, inclusive, or a cycloalkyl radical of 6–8 carbon atoms, inclusive, the total number of carbon atoms in said phosphine oxide being at least 16, to extract said alcohol and separating the extracted solution from said phosphine oxide compound.

4,544,780

CATALYTIC ISOMERIZATION OF TERTIARY OLEFINS

Stanley E. Wilson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

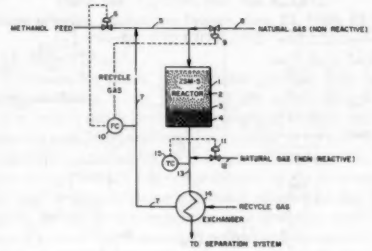
Filed Apr. 27, 1984, Ser. No. 604,358
Int. Cl.[4] C07C *5/24*
U.S. Cl. 585—377 **6 Claims**

1. A process for the isomerization of an olefin having a hydrogen atom attached to a carbon atom vicinal to the tertiary carbon of the double bond, which comprises treating the olefin in a solution of dry liquid sulfur dioxide in the presence of a hydroperoxide catalyst.

4,544,781
CONTROL OF TEMPERATURE EXOTHERMS IN THE CONVERSION OF METHANOL TO GASOLINE HYDROCARBONS

Paul K. Chao, Philadelphia, Pa.; Kevin J. Knob, Pitman, N.J., and Sergei Yurchak, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 9, 1985, Ser. No. 690,078
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—408 **17 Claims**



1. In a process wherein an oxygenated hydrocarbon feedstock is contacted with a catalyst in a catalyst bed at a stabilized operating temperature, and thereby converted into a mixture containing hydrocarbons boiling within the boiling point range of gasoline, and a gaseous fraction obtained from the effluent from said reactor bed is reinjected into the process at a location upstream of said catalyst bed, the improvement comprising:

(a) providing a source of a non-reactive gas which will provide a cooling effect at a temperature less than the stabilized operating temperature of said reactor bed;

(b) providing a zone of heat absorptive material downstream of said catalyst bed at a temperature equal to or less than the stabilized operating temperature of said catalyst bed;

(c) upon loss of flow of said gaseous fraction, flowing said non-reactive gas of (a) through said catalyst bed and through said zone of heat absorptive material; and

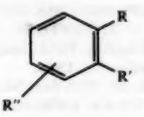
(d) upon resumption of flow of said gaseous fraction through said catalyst bed, terminating the flow of said non-reactive gas and resuming the conversion of oxygenated hydrocarbon product to a mixture containing hydrocarbons boiling within the boiling point range of gasoline.

4,544,782
THERMAL STYRENE FORMATION IN THE PRESENCE OF O_2

Orville L. Chapman, Los Angeles, and Uh-Po E. Tsou, La Palma, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 1, 1984, Ser. No. 576,051
Int. Cl.[4] C07C *15/02*
U.S. Cl. 585—443 **7 Claims**

1. A process for the production of a polymerizable styrene, which comprises the gas-phase thermolysis, in the absence of a dehydrogenation catalyst, of an aromatic compound having the formula:



in the presence of an oxygen pressure in an amount of at least 0.2 torr up to about 5% of the aromatic compound, wherein R is alkyl, hydroxyalkyl or alkylhalide; R' is H,alkyl, hydroxyalkyl, or alkylhalide, or where R and R' together form cyclobutene; and R'' is H or alkyl.

4,544,783
CONVERSION OF OXYGENATES TO HYDROCARBONS

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 581,498, Feb. 17, 1984, Pat. No. 4,515,682, which is a continuation-in-part of Ser. No. 375,076, May 5, 1982, Pat. No. 4,444,900. This application Feb. 19, 1985, Ser. No. 702,709
Int. Cl.[4] C07C *1/20, 1/00*
U.S. Cl. 585—469 **19 Claims**

1. A process for converting a feedstock comprising organic compounds selected from the group consisting of alcohol, carbonyl, ether and mixtures thereof to conversion products comprising hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a crystalline zeolite having an initial silica:alumina mole ratio greater than about 100:1 and having been synthesized from a reaction mixture comprising a diamine, said zeolite being treated by the sequential steps of reacting said zeolite with a dilute aqueous solution of hydrogen fluoride of from about 0.1 to about 5 Normal at a temperature of from about 0° C. to about 30° C. for a time of less than about 60 minutes, contacting said hydrogen fluoride reacted zeolite with aluminum chloride vapor at a temperature of from about 100° C. to about 850° C., and converting said aluminum chloride contacted material to hydrogen form.

4,544,784
METHANE CONVERSION

John A. Sofranko, Malvern, and C. Andrew Jones, Newtown Square, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 522,925, Aug. 12, 1983, Pat. No. 4,443,649, Ser. No. 522,944, Aug. 12, 1983, Pat. No. 4,444,984, Ser. No. 522,942, Aug. 12, 1983, Pat. No. 4,443,648, Ser. No. 522,905, Aug. 12, 1983, Pat. No. 4,443,645, Ser. No. 522,877, Aug. 12, 1983, Pat. No. 4,443,647, Ser. No. 522,876, Aug. 12, 1983, Pat. No. 4,443,644, Ser. No. 522,906, Aug. 12, 1983, Ser. No. 522,935, Aug. 12, 1983, Pat. No. 4,443,646, Ser. No. 522,938, Aug. 12, 1983, Ser. No. 522,937, Aug. 12, 1983, and Ser. No. 522,936, Aug. 12, 1983, said Ser. No. 522,925, is a continuation-in-part of Ser. No. 412,667, Aug. 30, 1982, abandoned, said Ser. No. 522,944, is a continuation-in-part of Ser. No. 412,655, Aug. 30, 1982, abandoned, said Ser. No. 522,942, is a continuation-in-part of Ser. No. 412,662, Aug. 30, 1982, abandoned, said Ser. No. 522,905, is a continuation-in-part of Ser. No. 412,663, Aug. 30, 1982, abandoned, said Ser. No. 522,877, is a continuation-in-part of Ser. No. 412,664, Aug. 30, 1982, abandoned, said Ser. No. 522,876, is a continuation-in-part of Ser. No. 412,665, Aug. 30, 1982, abandoned, said Ser. No. 522,906, is a continuation-in-part of Ser. No. 412,666, Aug. 30, 1982, abandoned, said Ser. No. 522,935, is a continuation-in-part of Ser. No. 412,649, Aug. 30, 1982, abandoned, said Ser. No. 522,938, is a continuation-in-part of Ser. No. 412,650, Aug. 30, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,668
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 **11 Claims**

1. In an improved method for converting methane to higher hydrocarbon products wherein a gas comprising methane is contacted at a temperature within the range of about 500° to 1000° C. with a contact solid comprising at least one reducible oxide of at least one metal which oxides when contacted with methane at said temperature are reduced and produce higher hydrocarbon products and water, the improvement which comprises conducting the contacting with said contact solid which further comprises at least one halogen or compound thereof.

4,544,785

METHANE CONVERSION

Howard P. Withers, Pottstown, and John A. Sofranko, Malvern, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,659
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 **19 Claims**

1. In an improved method for converting methane to higher hydrocarbon products wherein a gas comprising methane is contacted at a temperature selected within the range of 500° to 1000° C. with a contact solid comprising at least one reducible oxide of at least metal which oxides when contacted with methane at said temperature are reduced and produce higher hydrocarbon products and water, the improvement which comprises incorporating at least one chalcogen component into said contact solid.

4,544,786

METHANE CONVERSION USING A MAGNESIA/SILICA SUPPORT

E. William Breder, Jr., Oak Forest; John A. Jaecker, and Marvin F. L. Johnson, both of Homewood, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 16, 1984, Ser. No. 600,925
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 **12 Claims**

1. In an improved method for converting a gas comprising methane to higher hydrocarbons which comprises contacting said gas with a contact agent, said contact agent comprising:

(a) at least one metal, the oxide of which is reduced and produces higher hydrocarbons and water when contacted with methane at a selected temperature in the range of about 500° to about 1000° C.,

(b) an alkali metal, and

(c) a support,

the improvement which comprises employing said contact agent wherein said support comprises at least two oxides.

4,544,787

PREPARATIVE PROCESS FOR SUPPORTS

E. William Breder, Jr., Oak Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 16, 1984, Ser. No. 600,926
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 **5 Claims**

1. In an improved method for converting a gas comprising methane to higher hydrocarbons which comprises contacting said gas with a contact agent, said contact agent comprising a component of at least one metal, the oxide of which is reduced and produces higher hydrocarbons and water when contacted with methane at selected temperatures within the range of about 500° to about 1000° C., the improvement which comprises employing said contact agent produced by the steps of:

(a) combining hydroxylated magnesia and a component of silicon which forms silica and is readily suspendible in a continuous medium;

(b) contacting said combined components with said component of at least one metal; and

(c) calcining said contacted components to form said contact agent.

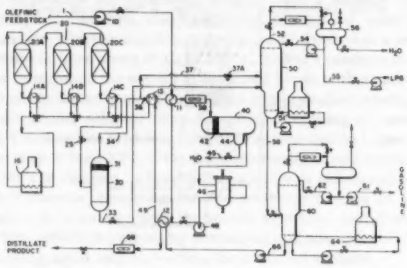
4,544,788

CONTROL SYSTEM FOR CATALYTIC CONVERSION OF OLEFINS TO HEAVIER HYDROCARBONS

Nicholas Daviduk, Pennington; Hartley Owen, Bell Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1984, Ser. No. 686,963
Int. Cl.[4] C07C *3/02, 3/20, 3/10*
U.S. Cl. 585—501 **7 Claims**

1. In a continuous catalytic conversion system for oligomerizing olefinic feedstock in contact with a bed of oligomerization catalyst at elevated temperature and pressure in an enclosed reaction system to produce an effluent stream comprising a mixture of heavy hydrocarbons and lighter hydrocarbons including means for flashing and phase separation of a liquid product stream rich in heavy hydrocarbons and a vapor stream rich in lighter hydrocarbons; the improvement which comprises a recycle control system including condenser means for condensing a major amount of said flashed vapor stream rich in lighter hydrocarbons, a surge drum for receiving said condensed stream, fluid handling means operatively connected between said surge drum and reactor for repressurizing and



combining a predetermined amount of recycled hydrocarbons with olefinic feedstock, valve means for withdrawing a vapor slipstream between said flashing means and said condenser means to divert flashed vapors;

means for detecting liquid level of condensed hydrocarbons in said surge drum and generating a signal representative of said liquid level; and

control means responsive to said level signal and operatively connected with the slipstream diverting valve means, whereby vapor slipstream flow is increased with increased surge drum liquid level above a predetermined level.

4,544,789

STEREOSELECTIVE SYNTHESIS OF INTERNAL OLEFINS

Theodore L. Brown, Urbana, Ill., and Philip O. Nubel, Westwood, N.J., assignors to University of Illinois Board of Trustees, Urbana, Ill.

Filed Sep. 6, 1983, Ser. No. 529,891
Int. Cl.[4] C07C *2/34*
U.S. Cl. 585—511 **13 Claims**

1. A stereoselective process for the synthesis of internal olelfins from terminal olefins, said terminal olefins having a lower molecular weight, comprising the steps of:

(a) affording a transition metal catalyst complex having two associated reactive sites, wherein the transition metal catalyst complex comprises the photolysis reaction product of a terminal olefin with two associated reactive sites of paired transition metal atoms;

(b) contacting at least one terminal olefin with the catalyst complex; and

(c) recovering the internal olefin product therefrom.

4,544,790

DIMERIZATION PROCESS AND CATALYSTS THEREFOR

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 26, 1984, Ser. No. 634,711
Int. Cl.[4] C07C *2/24*
U.S. Cl. 585—516 **25 Claims**

1. A process comprising contacting at least one dimerizable olefin with a catalyst consisting essentially of:

(a) at least one alkali metal,

(b) elemental copper, and

(c) potassium carbonate support; wherein components (a) and (b) are supported on component (c).

4,544,791

PROCESS FOR PRODUCING PREMIUM GASOLINE BY POLYMERIZING C_4 CUTS

Bernard Juguin, Rueil-Malmaison, and Jean Miquel, Paris, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 22, 1984, Ser. No. 623,672

Claims priority, application France, Jun. 22, 1983, 83 10431

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—517 **12 Claims**

1. A process for producing premium gasoline from olefinic C_4 cuts containing 1- and 2-butenes and isobutene and made free of at least a major part of the butadiene initially contained therein, the process consisting of converting at least 97% of the total isobutene content of the charge and at least the major portion of the 1- and 2-butenes thereof to C_4 hydrocarbons dimers and trimers without producing substantial amounts of kerosene, said process comprising, in a first step, treating the olefinic C_4 cut in a first so-called polmerization catalytic zone, at input and output temperatures ranging from 40° to 250° C., under a pressure from 0.1 to 10 MPa, with a flow rate of liquid hydrocarbons (space velocity) from about 0.05 to 5 volumes per volume of catalyst and per hour, in the presence of a catalyst selected from the group consisting of silica-aluminas, boron-containing aluminas and transition aluminas treated with at least one fluorine acid derivative, so as to convert at least 80% of the isobutene to isobutene dimers and trimers and to convert at most 45% of the mixture of 1- and 2-butenes to dimers and trimers thereof, in that, subsequently, fractionating the effluent from said first catalytic polymerization zone so as to recover, on the one hand, from the column bottom, essentially the C_4 olefinic hydrocarbons dimers and trimers and, on the other hand, from the top of the column, a mixture containing the major part of the isobutene and 1- and 2-butenes not converted in said first catalytic polymerization zone, feeding said mixture, during a second step, at least partly to a second catalytic polymerization zone operating at input and output temperatures from 40° to 250° C., under a pressure from 0.1 to 10 MPa and with a flow rate of liquid hydrocarbons (space velocity) from about 0.05 to 5 volumes per volume of catalyst and per hour, the input and output temperatures of the second polymerization zone being each from 20° to 60° C. higher than the input and output temperatures of the first polymerization zone, the pressure in the second polymerization zone being from 0.4 to 3 MPa higher than the pressure in the first polymerization zone, in the presence of a catalyst selected from the group consisting of silica-aluminas, boron-containing aluminas and transition aluminas treated with at least one fluorine acid derivative, so as to convert (a) substantially the total amount of isobutene to isobutene dimers and trimers in said second zone and (b) at least 50% of the 1- and 2-butenes, supplied to said second zone, to n-butenes dimers and trimers.

4,544,792

UPGRADING FISCHER-TROPSCH OLEFINS

Fritz A. Smith, New Hope, Pa., and Samuel A. Tabak, Wenonah, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

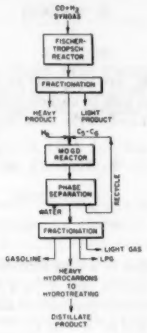
Filed Dec. 13, 1984, Ser. No. 681,413

Int. Cl.[4] C07C *1/20, 3/06*

U.S. Cl. 585—533 **13 Claims**

1. A continuous process for converting a feedstock mixture comprising a major amount of lower olefins and a minor amount of oxygenated hydrocarbons to higher hydrocarbons including distillate product comprising:

contacting the feedstock in the presence of about 1 to 50 mole percent hydrogen with a shape selective medium pore oligomerization acid zeolite catalyst under reaction conditions at elevated temperature up to about 325° C. in



a pressurized reactor zone to convert olefins to heavier hydrocarbons.

4,544,793

CRYSTALLINE ZEOLITE, METHOD OF PREPARING SAME AND PROCESS FOR THE PRODUCTION OF OLEFINS USING SAME AS CATALYST

Hideo Okado, Ushiku; Kazuo Hashimoto, Ube; Kichinari Kawamura, Tsuchiura; Yasuyoshi Yamazaki, Yatabe, and Haruo Takaya, Abiko, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,257

Claims priority, application Japan, Nov. 24, 1982, 57-205839

Int. Cl.[4] C07C *1/00*

U.S. Cl. 585—640 **5 Claims**

1. A process for subjecting methanol and/or dimethyl ether to pyrolysis to obtain olefins, comprising contacting a gas stream containing methanol and/or dimethyl ether with a catalyst which is crystalline aluminosilicate having the following empirical formula:

$$xM_2O.yM'O.Al_2O_3.\ zSiO_2.nH_2O$$

wherein M is an exchangeable cation selected from the group consisting of alkali metals, hydrogen and mixtures thereof, M' is Ca or Sr, x is a number of between 0 and 1.5, y is a number of between 1.4 and 40, z is a number of between 97.7 and 3000 and n is a number of between 0 and 40 and wherein $x+y$ is at least 1.4, said aluminosilicate having the x-ray diffraction lines of Table 1 of the specification.

4,544,794

ALKYLATION AIDE FOR SULFURIC ACID CATALYZED ALKYLATION UNITS

Richard F. Miller, Humble, and Michael P. Nicholson, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

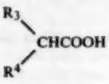
Filed Dec. 10, 1984, Ser. No. 680,033

Int. Cl.[4] C07C *2/58*

U.S. Cl. 585—721 **20 Claims**

1. In an alkylation process comprising contacting an alkylatable hydrocarbon with an olefinic alkylating agent at alkylation conditions in the presence of an acid catalyst and an alkylation promoter, the improvement comprising using in combination as the promoter a first carboxylic acid having the structure

wherein R, R′ and R″ are the same or different alkyl groups and the average total sum of carbon atoms in R, R′ and R″ is 3 to 30 and a second carboxylic acid having the structure



wherein R^3 is hydrogen or a saturated or ethylenically unsaturated hydrocarbon radical and R^4 is a saturated or ethylenically unsaturated hydrocarbon radical and the average sum of carbon atoms in R^3 and R^4 is 8 to 28.

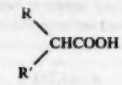
4,544,795

ALKYLATION AIDE FOR SULFURIC ACID CATALYZED ALKYLATION UNITS

Richard F. Miller, Humble, and Michael P. Nicholson, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1984, Ser. No. 680,032
Int. Cl.[4] C07C *2/58*
U.S. Cl. 585—721 **15 Claims**

1. In an alkylation process comprising contacting an alkylatable hydrocarbon with an olefinic alkylating agent at alkylation conditions in the presence of an acid catalyst and an alkylation promoter, the improvement comprising using as the promoter a fatty acid having the structure



wherein R is hydrogen or a saturated or ethylenically unsaturated hydrocarbon radical and R′ is a saturated or ethylenically unsaturated hydrocarbon radical and the average sum of carbon atoms in R and R′ is 14 to 38.

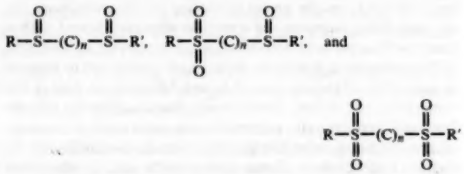
4,544,796

SOLVENT EXTRACTION OF AROMATIC COMPOUNDS USING ALKYLSULFOXIDE SOLVENTS

Paul R. Kurek, Schaumburg; Dusan J. Engel, Des Plaines, and Richard L. Fergin, Mount Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 457,545, Jan. 12, 1983, abandoned. This application Jul. 13, 1984, Ser. No. 630,909
Int. Cl.[4] C10G *21/16, 21/22*
U.S. Cl. 585—856 **21 Claims**

1. A process for the solvent extraction of an aromatic compound from a mixture of said aromatic compound and other hydrocarbons which comprises treating said mixture with a solvent selected from the group consisting of compounds having the generic formulae:



in which R and R′ are alkyl radicals containing from about 1 to 10 carbon atoms and n is an integer of from 3 to about 30 carbon atoms at extraction conditions, and recovering the purified aromatic compound.

4,544,797
METHOD FOR PREVENTING SHORT-CIRCUITS OR SHUNTS IN A LARGE AREA THIN FILM SOLAR CELL AND CELL OBTAINED THEREBY

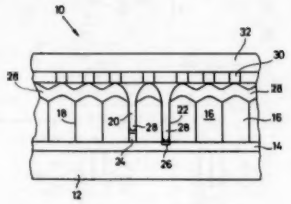
Gert Hewig, Alzenau, Fed. Rep. of Germany, assignor to NUKEM GmbH, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,296

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312053

Int. Cl.⁴ H01L *31/06, 31/18*

U.S. Cl. 136—249 **12 Claims**



1. A method for preventing short-circuits or shunts in a large area thin film solar cell, said method comprising the steps of sequentially applying, to a substrate comprising a first conductive electrical contact, (a) at least one first layer comprising a p-type or n-type conductive layer, and (b) a second layer comprising an n-type or p-type conductive layer or a Schottky barrier layer, said second layer also being provided with a second conductive electrical contact wherein, after forming the first layer and before application of the second layer, there is practiced the step of passivating those areas of the first conductive electrical contact which are effectively uncovered by the first layer.

12. A tandem-solar cell system including a plurality of solar cells each made according to the method of claim 1.

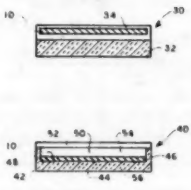
4,544,798
PHOTOVOLTAIC PANEL HAVING ENHANCED CONVERSION EFFICIENCY STABILITY

Vincent D. Cannella, Detroit, Mich., assignor to Sovonics Solar Systems, Solon, Ohio

Continuation of Ser. No. 450,920, Dec. 20, 1982, abandoned. This application Jul. 31, 1984, Ser. No. 636,172

Int. Cl.⁴ H01L *31/04*

U.S. Cl. 136—251 **14 Claims**



1. A photovoltaic panel for converting light into electrical energy having enhanced energy conversion efficiency stability, comprising;

at least one photovoltaic device, formed from amorphous semiconductor alloys, that exhibits an energy conversion efficiency stability that increases at elevated operating temperatures of the device, said device including a conductive substrate upon which said amorphous semiconductor alloys are formed; and

an enclosure housing said device for elevating the operating temperature of said photovoltaic device, said enclosure including means for preventing loss of heat from the interior of said enclosure and from said device for continuously maintaining the operating temperature of said device upon exposure to light at a substantially elevated temperature above the ambient temperature external to said enclosure.

4,544,799
WINDOW STRUCTURE FOR PASSIVATING SOLAR CELLS BASED ON GALLIUM ARSENIDE

Allen M. Barnett, Newark, Del., assignor to University of Delaware, Newark, Del.

Filed Apr. 30, 1984, Ser. No. 605,038

Int. Cl.⁴ H01L *31/06*

U.S. Cl. 136—262 **4 Claims**

4. A photovoltaic solar cell having a layered structure comprising in order, a transparent electrical contact, an optically transparent window layer, a gallium arsenide absorber-generator layer, a gallium arsenide collector-converter layer, wherein the absorber-generator and the collector-converter layers respectively are doped to provide opposite conductivity types, and an optically opaque electrically conductive layer, wherein the optically transparent window layer is gallium arsenide phosphide graded from a phosphorus-rich portion in contact with transparent electrical contact and an arsenic-rich portion in contact with the gallium arsenide absorber-generator layer.

4,544,800
CABLE HOLDER

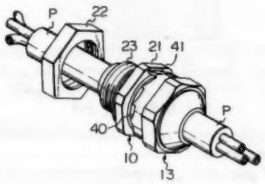
Nobuo Katsuura, Yokohama, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,577

Claims priority, application Japan, Dec. 25, 1982, 57-226529

Int. Cl.⁴ H02G *15/013*

U.S. Cl. 174—65 SS **8 Claims**



1. A cable holder which comprises:

a mounting body with a hollow cylindrical member for receiving a cable therethrough and having an outer thread formed along its periphery extending toward one end thereof and a funnel-shaped conical surface extending from said one end toward the inner periphery of the cylinder;

a clamping cap with an opening on each end in its axial direction and having an internal thread formed along its cylindrical part which engages said outer thread, one end of said clamping cap having an inner conical surface tapered toward said one end with the same inclination as that of said funnel-shaped conical surface; and

a frustoconical gripper assembly for gripping the cable which is inserted between said mounting body and said clamping cap and which has an outer conical surface of the same inclination as that of said conical surfaces to be engageable with the cable, said hollow cylindrical member, clamping cap and gripper assembly being made of an electrically insulating, resilient plastic material, said gripper assembly being provided with a plurality of beaked unit blades which are circularly arranged in such a fashion that the outer periphery of the beak portion of each unit blade overlaps partially and radially with the inner periphery of an immediate adjacent unit blade which is ahead of the beak of said each unit blade, the base of the beak of

said each unit blade being integrally linked by an arched strip with the rear part of an immediate adjacent unit blade which is in front of the beak of said each unit blade, a first innermost circumferential surface of each blade nearer to the tip of the beak portion and a first outermost circumferential surface of each unit blade remote from said tip of the beak portion being concentric with respect to the center of the gripper assembly, a second innermost circumferential surface contiguous with the rear part of the first innermost circumferential surface and a second outermost circumferential surface forming that part of the beak facing opposite to the second innermost circumferential surface being eccentric with respect to the center of the gripper assembly but concentric with another center, said each unit blade being movable along the inner periphery of an immediate adjacent unit blade which is ahead of said each unit blade.

4,544,801

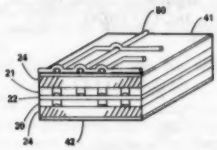
CIRCUIT BOARD INCLUDING MULTIPLE WIRE PHOTOSENSITIVE ADHESIVE

William J. Rudik; George P. Schmitt, both of Vestal, and John F. Shipley, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 392,997, Jun. 28, 1982,. This application Aug. 9, 1984, Ser. No. 639,152

Int. Cl.[4] H05K *1/03*

U.S. Cl. 174—68.5 **2 Claims**



1. An encapsulated wire circuit board comprising:
(a) a rigid base plane;
(b) a layer of glass epoxy pre-preg covering said base plane;
(c) a layer of photocurable adhesive covering said epoxy pre-preg, said adhesive having at ambient temperature a Loss Angle Ratio between one tenth and one and a Storage Shear Modulus G' greater than ten to the seventh power and less than ten to the eighth power, said Storage Shear Modulus G' being less than ten to the sixth power at 149.9 degrees centigrade; and
(d) insulated wires encapsulated in said adhesive.

4,544,802

CIRCUIT CHANGE PIN AND CIRCUIT BOARD ASSEMBLY

Dennis C. Siden, Portola Valley, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

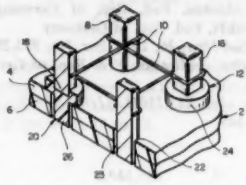
Filed Jun. 29, 1984, Ser. No. 625,927

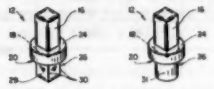
Int. Cl.[4] H05K *1/00*; H01R *9/09*

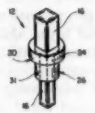
U.S. Cl. 174—68.5 **26 Claims**

1. A circuit change pin comprising a termination post held in a compliant electrically insulating base, wherein said base is made from a heat-recoverable material and is solid except wherein said termination post is held in said base.

14. A circuit board assembly comprising a printed circuit board and at least one circuit change pin; said printed circuit board having at least one plated-through hole; said circuit change pin comprising a termination post held in a compliant electrically insulating base, wherein said base is made from a heat recoverable material and is solid except wherein said termination post is held in said base; said circuit change pin







base engaging the plated through hole of said printed circuit board.

4,544,803

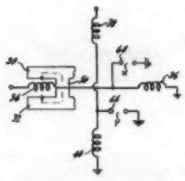
POSITIONAL TRANSDUCER

George E. Schaller, Denville, N.J., assignor to Ceramic Magnetics, Inc., Fairfield, N.J.

Filed Jun. 11, 1984, Ser. No. 619,544

Int. Cl.[4] G08C *21/00*; H01F *21/06*

U.S. Cl. 178—18 **2 Claims**



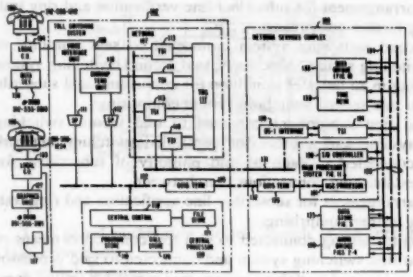
1. A positional transducer comprising a nonconductive plate, position sensor means including at least two permanent magnets mounted on opposite sides of said plate for movement relative to said plate with the opposite poles of said magnets in magnetic interaction and sensor means mounted at preselected locations relative to said plate to be affected by the magnetic field produced by said permanent magnets, means functionally engaging said magnets to vary the position of said magnets relative to said sensor means to control the relative amount of magnetic flux reaching each sensor means in dependence upon the relative position of the permanent magnets to such sensor means and means coupled to said sensor means for producing at least one output signal indicative of the relative position of the magnets relative to said sensor means.

4,544,804

CONFERENCE CONTROL TRANSFER ARRANGEMENT

Diane E. Herr, Warrenville, Ill.; Laddie E. Suk, Readington, N.J., and David F. Winchell, Glen Ellyn, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 24, 1983, Ser. No. 460,367
Int. Cl.[4] H04M *3/56, 3/58*
U.S. Cl. 179—18 BC 8 Claims



1. An arrangement for conferencing a plurality of customer stations comprising

a multiport conference bridge,

means effective when coupled to one of said stations for controlling the connection of other said stations to said ports of said bridge, and

means responsive to a conference request signal from a calling one of said stations for coupling said controlling means exclusively to said calling station,

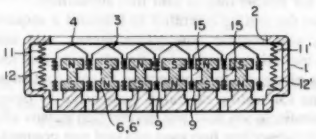
said controlling means including means responsive to control signals form said calling station when coupled thereto for transferring the coupling of said controlling means from said calling station to another said station independently of the coupling of said calling station to said bridge.

4,544,805

PLANE SPEAKER

Tadashi Sawafuji, No. 9-15, Nishi-Sugamo 1-chome, Toshima-ku, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,378
Claims priority, application Japan, Sep. 25, 1981, 56-142775[U]; Sep. 25, 1981, 56-142776[U]; Dec. 14, 1981, 56-185989[U]
Int. Cl.[4] H04R *7/02*
U.S. Cl. 179—115.5 PV 1 Claim



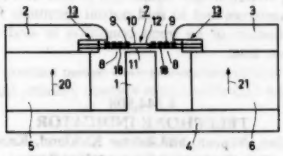
1. A plane speaker comprises a frame having an opening portion; a plane diaphragm which has its peripheral edge portion secured to said frame facing said opening portion of the frame and has been provided with a number of parallel cone-shaped projections; a folded actuating plate which is formed separately from said diaphragm and attached perpendicularly to the back only of said diaphragm; a coil printed on both surfaces of the actuating plate; and a magnet disposed on the frame oppositely to said coil, said actuating plate made by repeatedly folding a piece of flexible web zigzag in the longitudinal direction and attaching one edge thereof to the back of the diaphragm.

4,544,806

RIBBON-TYPE TRANSDUCER WITH A MULTI-LAYER DIAPHRAGM

Joris A. M. Nieuwendijk; Wilhelmus D. A. M. van Gijsel, and Georgius B. J. Sanders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,706
Claims priority, application Netherlands, Mar. 8, 1983, 8300835
Int. Cl.[4] H04R *7/06, 7/18, 9/00*
U.S. Cl. 179—115.5 PV 5 Claims



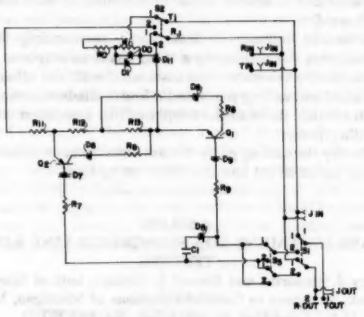
1. An electro-acoustic transducer of the ribbon-type comprising: a magnet system having a pole plate and a centre pole between which at least one air gap is formed, a diaphragm arranged in the air gap and which comprises two or more foils which all extend substantially parallel to each other in the diaphragm plane, every two adjacent foils being joined to each other at the periphery thereof in a substantially air-tight manner so as to provide a space therebetween, and a conductor arranged on each of the foils with the conductors electrically arranged such that all of the foils move at least substantially in phase with each other when an electric signal is applied to the transducer.

4,544,807

FAULT DETECTOR TEST INSTRUMENT

Gilbert L. Sers, 648 Martense Ave., Teaneck, N.J. 07666

Filed Jun. 13, 1983, Ser. No. 503,729
Int. Cl.[4] H04B *3/46*
U.S. Cl. 179—175.11 7 Claims



1. A telephone test apparatus for use in determining faults and the direction thereof in a subscriber's telephone lines comprising:

input circuit means including input terminals and jack terminals, a plurality of light-emitting diodes connected in parallel opposed relation, and voltage divider circuit means, means operatively connecting said voltage divider circuit means with said diodes such that said diodes can indicate the polarity of supplied voltage to said apparatus from said telephone lines, and first switch means with a first pair of terminals for connecting said input terminals

and said jack terminals to said plurality of diodes and said voltage divider circuit means; and

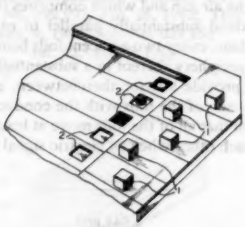
output circuit means including output terminals and a pair of transistors, means connecting said transistors with a second pair of terminals of said first switch means; said transistors each having first, second and third electrodes; diode means connecting said second electrode of a first of said transistors to said third electrode of the second of said transistors; further voltage divider means, means connecting said further voltage divider means with said transistors and with said second pair of terminals for supplying voltage from said input terminals to said transistors; and reversing switch means connected to said first electrodes of said transistors and to said output terminals for enabling determination of an open condition in said subscriber's telephone line.

4,544,808

TELEPHONE INDICATOR

Robin I. Milne, Nepean, and Lester Kirkland, Kanata, both of Canada, assignors to Mitel Corporation, Kanata, Canada

Filed Oct. 14, 1983, Ser. No. 542,038
Claims priority, application Canada, Dec. 14, 1982, 417653
Int. Cl.[4] H04M *1/22*
U.S. Cl. 179—99 LS **29 Claims**



1. Telephone line status indicating means comprising:

a first indicator enclosed within a second indicator for displaying a first shade in response to one status of a telephone line associated with one of a calling and called party and a second shade in response to another status thereof,

the second indicator at least partly surrounding the first indicator for displaying a third shade in response to one status of a telephone line associated with the other of the called and calling party and a fourth shade corresponding to another status of the telephone line associated with said other party,

whereby the calling party obtains simultaneous indication of the status of his and the called party lines.

4,544,809

ARRANGEMENT FOR SUBSCRIBER LINE RING TESTING

Jeffrey J. Stuparits, and Russell L. Cramer, both of Muskegon, Mich., assignors to General Telephone of Michigan, Mich.

Filed Dec. 21, 1983, Ser. No. 563,737
Int. Cl.[4] H04M *3/26*
U.S. Cl. 179—175.2 R **7 Claims**

1. In a pre-cutover switching configuration, an arrangement for subscriber line verification and ring testing comprising:

a plurality of switching system subscribers;

a first switching system connected to said plurality of switching system subscribers, said first switching system operated to connect any of said switching system subscribers to other switching system subscribers, said first switching system comprising:

said plurality of switching system subscribers including at least a first subscriber operatively connected to said first switching system for said connection to other switching system subscribers; and

test connection means connected to said first subscriber and said test connection means operated to connect said first subscriber through said first switching system for a test access;

regular connection means connected to said first subscriber and operated to connect any of said switching system subscribers to said first switching system subscriber;

said arrangement for subscriber line verification and ring testing further comprising:

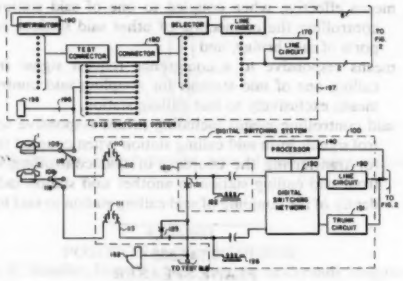
a second switching system connected to said plurality of switching system subscribers, said second switching system being in an untested condition for connecting said subscribers, said second switching system comprising:

said first subscriber connected to said second switching system; and a processor controlled switching network connected to each of said plurality of subscribers for establishing connections therebetween;

said arrangement for subscriber line verification and ring testing further comprising:

means for testing connected to said test connection means of said first switching system and connected to said processor of said second switching system, said means for testing operated to request transmission of ringing signal data to said means for testing;

said means for testing further operated to store said data;



said means for testing connected to said first subscriber via said test connection means for said test access;

said means for testing operated to test for a non-busy condition of said first subscriber via said test connection means and thereafter operated to close said first subscriber line loop via said test connection means;

said means for testing connected to said regular connection means for connecting to said first subscriber;

said means for testing operated to transmit a sequence of signals to said regular connection means, said sequence of signals including a number of signals being one less than the number of signals for connecting to said first subscriber;

said means for testing operated responsive to detection of a busy condition via said test connection means after closing said first subscriber line loop via said test connection means to transmit a second signal via said regular connection means;

said regular connection means operated in response to said second signal to complete said connection of said regular connection means to said first subscriber and to apply ringing current to said first subscriber, said means for testing operated upon detecting said ringing current via said test access means to release said regular connection means, said means for testing thereafter operated to determine the frequency of the detected ringing and to compare it with said stored data; and

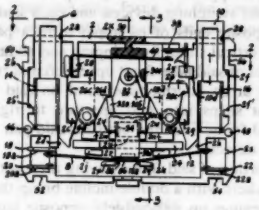
said means for testing further operated to store an indication of said data and said ringing current frequency.

4,544,810

INTERLOCKING PUSHBUTTON SELECTOR SWITCH

Edmund M. Butterworth, Brown Deer, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 9, 1984, Ser. No. 569,126
Int. Cl.[4] H01H 9/20
U.S. Cl. 200—5 B 8 Claims



1. A plural pushbutton electric switch of the interlocking type comprising:

a switch housing;

contacts mounted in said housing;

a pair of spring-biased pushbuttons for operating respective switch contacts in said housing;

an interlock member mounted in said housing between said pushbuttons;

means operable when one of said pushbuttons is depressed into contact operating position for rendering said interlock member effective to prevent simultaneous depression of the other pushbutton;

and latching means comprising:

a pair of latching members movably mounted in said housing, one for each of said pushbuttons;

a spring-biased depressible release member mounted in said housing between said pushbuttons;

an actuating member between said latching members movably mounted on said release member and normally engaging said latching members to bias the same against the respective pushbuttons under the spring bias of said release member and being engaged by said latching members to maintain said release member in depressed position;

and means responsive to depression of one of said pushbuttons into said contact operating position for causing the associated latching member to latch the same in said contact operating position under the control of said spring-biased release member and actuating member as said release member restores to undepressed position, requiring depression of said release member against its spring bias to allow restoration of said latched pushbutton.

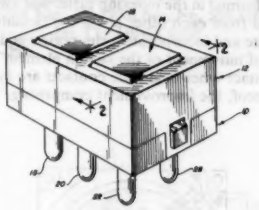
4,544,811

ELECTRIC SWITCH

Arnold A. Brevick, Hamilton, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

Filed Jun. 8, 1984, Ser. No. 618,477
Int. Cl.[4] H01H 9/30
U.S. Cl. 200—5 R 5 Claims

1. In an electric switch, means for effecting sequential contact at two different contact locations comprising, in combination, primary contact means made of a metal having relatively high conductivity, secondary contact means made of a metal having relatively low conductivity and mounted adjacent to said primary contact means, said secondary contact means being yieldingly biased to a position where it engages a mating contact before said primary contact means thereby causing deflection of said secondary contact means relative to said primary contact means until said primary contact means also engages said mating contact, and snap-action actuator means for producing rapid relative movement between said mating contact and said primary and secondary contact means so as to reduce the time interval between engagement of said



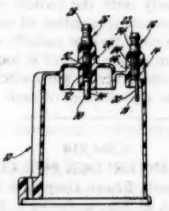
secondary contact means with said mating contact and engagement of said primary contact means with said mating contact.

4,544,812

IGNITION DISTRIBUTOR CAP

Robert C. Buttry, Middletown, and James A. Boyer, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1984, Ser. No. 651,151
Int. Cl.[4] H01H 19/00; F02P 7/00
U.S. Cl. 200—19 DC 2 Claims



1. A distributor cap comprising, a cap member formed of plastic material having a tower, a terminal extending through said tower having a portion thereof located exterior of said cap member and portion located at the interior of said cap member that is adapted to cooperate with the contact of a distributor rotor, said terminal having a plurality of axially spaced radially extending D-shaped ribs the radial extent of which progressively increases from one rib to another rib in one axial direction from the end of the terminal located in the cap member toward the end of the terminal located outside the cap member, the spaces between said ribs defined by inwardly tapering surfaces defining tapered recesses, said recesses being at least partially filled with the material of said cap member and said cap material engaging the outer surfaces of said D-shaped ribs, whereby said terminal is anchored from rotative and axial movement relative to said cap member.

4,544,813

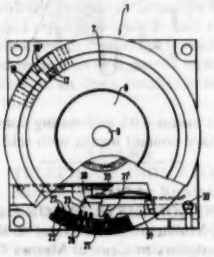
INDEXING PLATE FOR A TIME SWITCH

Alfred Meisner, and Alfred-Günther Lunz, both of Nuremberg, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 618,929
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321539
Int. Cl.[4] H01H 7/00
U.S. Cl. 200—38 R 8 Claims

1. In an indexing plate and a switch element for a timeclock, said indexing plate including slide contacts at the circumference of the indexing plate which are radially displaceable to latch from an inoperative position into at least one switching

position, each said slide contact having a manipulating projection and a switching finger opposite thereto and which are conducted intermediate the projection and finger through slide projections formed in the indexing plate, said switching fingers being spaced from each other along the circumference of the indexing plate and incorporate a rim region and a switch edge in the path of movement of the switch element for contacting a switch contact when said slide contacts are in the switching position thereof, the improvement comprising:



guide walls on said indexing plate for each said switching finger, said guide walls include rim edges which, in the inoperative position of each said switching finger substantially align planarly with the switch edges thereof, and wherein in the switching position of each said switching finger the switch edge thereof radially overhangs the rim edges and the rim region thereof is located intermediate said guide walls, and wherein said switch element radially strikes against the switch edge of each switching finger.

4,544,814

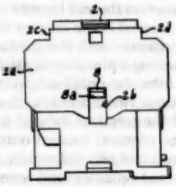
MECHANICAL INTERLOCK FOR CONTACTORS

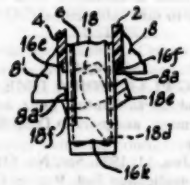
Edmund M. Butterworth, Brown Deer, and William G. Dennison, Cedarburg, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 19, 1984, Ser. No. 572,032

Int. Cl.[4] H01H 9/26

U.S. Cl. 200—50 C **5 Claims**





1. In an electrical switching system having a pair of electrical switching devices mounted adjacent one another in predetermined spaced apart relation and each said switching device having a housing with a flat wall and an aperture in said flat wall and a switch actuating member within said housing having a projection extending substantially into the plane of said flat wall and being accessible through said aperture, and the flat walls of said switching devices facing one another, means for interlocking said switch actuating members for operation one at a time comprising:

false-front upper left and right corners on each said flat wall;

a generally T-shaped integrally molded frame comprising symmetrical opposite sides in juxtaposition with said flat walls of said switching devices, and each said side having at the opposite ends of its upper arms a pair of hooks defining vertical slides for gripping and sliding down the outer edges of said false-front upper left and right corners, and a lug at an intermediate point on said side of said frame that snaps into said aperture to rigidly snap-in mount said frame onto and between said pair of electrical switching devices;

the lower portion of said frame having therewithin a pair of lateral pockets with a double-incline bump therebetween;

a pair of openings on respectively opposite lateral sides of said frame;

and a spring-biased pawl movably confined within said frame and having a pair of opposite wings extending through said openings below said projections of said switch actuating members of said pair of switching devices and a toe at its lower end poised above said double-inclined bump such that when one of said switch actuating members is operated, it depresses the corresponding wing to rock said pawl thereby causing said toe to slide down the opposite incline of said bump into the corresponding pocket to stop said pawl so that the other wing thereof restrains the other switch actuating member from being operated.

4,544,815

MULTIPLE KEY SWITCH

Albert Portmann, Murten, Switzerland, assignor to SODECO - SAIA AG, Murten, Switzerland

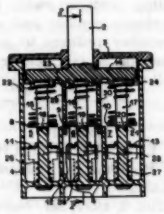
PCT No. PCT/CH83/00056, § 371 Date Jan. 17, 1984, § 102(e) Date Jan. 17, 1984, PCT Pub. No. WO84/00639, PCT Pub. Date Feb. 16, 1984

PCT Filed May 5, 1983, Ser. No. 577,623

Claims priority, application Switzerland, Jul. 22, 1982, 4476/82

Int. Cl.[4] H01H 1/20, 9/26, 15/06

U.S. Cl. 200—50 C **5 Claims**



1. A multipole key switch comprising

a case;

a plurality of individual switching chambers disposed in the case;

an actuating ram longitudinally slidable within the case from a rest position;

a cross-web disposed at the actuating ram adjacent to the inner side of the upper part of the case;

individual contact supports provided at the cross-web, which individual contact supports penetrate into the individual switching chambers;

a contact bridge disposed on each contact support and hung rockingly around its bridge center for making contact

with fixed position contact fingers disposed within said chambers, when said actuating ram is longitudinally slid within said case from said rest position;

a restoring spring for each switching chamber, for contributing to a restoring force for the actuating ram to restore the rest position of the actuating ram against said longitudinal slidability, the strength of the restoring springs being chosen such that in case of a failure of one of the restoring springs the restoring force of the remaining restoring springs is sufficient to restore the actuating ram to its rest position.

4,544,816

SWITCHING ARRANGEMENT FOR A ROTATING TOOTHBRUSH

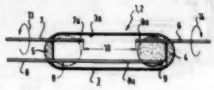
Dieter Benz, Hirschstrasse 21, D-7900 Ulm, Fed. Rep. of Germany

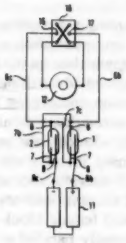
Filed Nov. 10, 1983, Ser. No. 551,821

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309412

Int. Cl.⁴ A46B *9/04, 13/02*; H01H *29/20, 35/02*

U.S. Cl. 200—52 R **31 Claims**





1. A switching arrangement for a rotating toothbrush having a casing and being driven by a motor accommodated within the casing, the arrangement comprising:

two sensors provided as a gravity switch each including a tube defining a closed interior and having an inner diameter and two opposing bottom portions in longitudinal direction of the tube, each of the bottom portions being arranged at a respective end of the tube; a first conductor wire having a forward portion projecting into the interior of the tube through one of the bottom portions; a second conductor wire having a foward portion projecting into the interior of the tube through the other of the bottom portions and being arranged at a distance to the first conductor wire; a third conductor wire having a forward portion projecting into the interior of the tube through one of the bottom portions at a distance to the first and second conductor wires and extending almost to the other of the bottom portions; and a mercury bead located in the interior of the tube and having a diameter smaller than the inner diameter of the tube for reversing the direction of rotation of the motor in dependence on the position of the toothbrush.

4,544,817

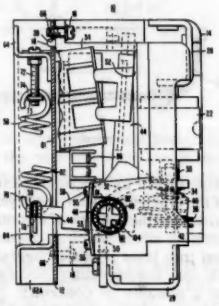
VACUUM CONTACTOR WITH KICKOUT SPRING

Robert T. Basnett, Hendersonville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 29, 1983, Ser. No. 556,258

Int. Cl.⁴ H01H *9/08*

U.S. Cl. 200—293 **3 Claims**



1. An electrical contactor, comprising:

a first frame;

a coil spring adjustably attached at one end thereof to said first frame, another portion thereof being free to move among three levels of spring tension, the least tense of said three levels being defined by a spring travel limiting member on said first frame; and

a second frame, said second frame having a set of separable contacts disposed thereon, said second frame having a lever pivotally disposed thereon in mechanical cooperation with said contacts, said lever being pivotable between a first angular position which defines said contacts in a closed state and a second angular position which defines said contacts in an open state, said second frame having a force providing means thereon which cooperates with said contacts to cause said contacts to be in said closed state when said force providing means is actuated, said first frame and said second frame being arrangeable in either a fixed relationship with respect to each other or a non-fixed relationship with respect to each other, said fixed relationship being indicative of an operational disposition and said non-fixed relationship being indicative of a servicing disposition, in said fixed relationship a portion of said lever being captured by said another portion of said coil spring when said coil spring is in either a highest adjustable level of spring tension or an intermediate adjustable level of spring tension, said highest adjustable level of spring tension being representative of said contacts being in said closed state and said intermediate adjustable level of tension being representative of said contacts being in said open state, in said non-fixed relationship said coil spring being in said least level of spring tension, said least level of spring tension having the characteristic of being at a greater value of spring tension than that which would require readjustment of said coil spring after said first frame and such second frame have been placed in said non-fixed disposition.

4,544,818

COOKING UTENSIL FOR INDUCTION COOKING APPARATUS

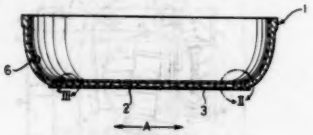
Ataru Minamida, Saitama, Japan, assignor to Asahi Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 402,849, Jul. 29, 1982,. This application Mar. 1, 1984, Ser. No. 585,295

Claims priority, application Japan, Apr. 13, 1983, 58-55095[U]; Apr. 28, 1983, 58-65596[U]; Apr. 28, 1983, 58-65595[U]

Int. Cl.⁴ H05B *6/12*

U.S. Cl. 219—10.49 R **11 Claims**



1. A cooking utensil for electromagnetic induction cooking apparatus of the type wherein an iron layer is flame-sprayed on the outer surface of the bottom of a container body of aluminum or aluminum alloy, which is characterized in that said flame-sprayed iron layer is made integral to the bottom in a manner such that corresponding portions of said layer are wedged into a plurality of concentric grooves which have been pre-formed on the outer surface of said bottom, the said grooves being each defined by converging walls which each incline away from the axis of said utensil; the included angle between the said converging walls being from 15° to 45°.

4,544,819

WIRE-CUT, ELECTRIC DISCHARGE MACHINING METHOD

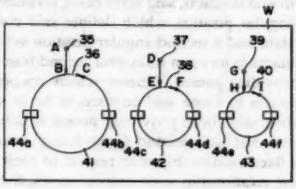
Yoshiyuki Nomura, Hachioji; Kanemasa Okuda, Hino, and Hisao Ishii, Mitaka, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 352,551, Feb. 26, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 624,806

Claims priority, application Japan, Mar. 2, 1981, 56-29731

Int. Cl.⁴ B23P *1/08*

U.S. Cl. 219;69 W **3 Claims**



1. An automatic wire-cut, electric discharge machining method for cutting a workpiece having at least one machining start hole into a desired number of closed loop configurations by means of a wire-cut, electric discharge machine provided with an automatic wire feed mechanism for automatically installing a wire electrode on a wire electrode running system through the machining start hole, the method comprising the steps of:

(a) starting automatic electric discharge machining from a machining start hole corresponding to the closed loop configuration to be wire-cut;

(b) performing the electric discharge machining in a first direction and along the closed loop configuration to a point of suspension of the electric discharge machining operation where a part of the closed loop configuration is left uncut, such that if the wire electrode breaks while machining along the first direction, the wire electrode is automatically reinserted in the start hole and machining automatically continues along the first direction until said point of suspension is reached;

(c) removing the wire electrode from the workpiece;

(d) fixing at least one portion of the machined closed loop configuration to the workpiece;

(e) inserting the wire electrode into the machining start hole by the automatic wire feed mechanism; and

(f) performing automatic electric discharge machining in a second direction to cut off the part left uncut, such that if the wire electrode breaks while machining along the second direction, the wire electrode is automatically reinserted in the start hole and machining automatically continues along the second direction.

4,544,820

DIE FORMING METHOD AND MACHINE

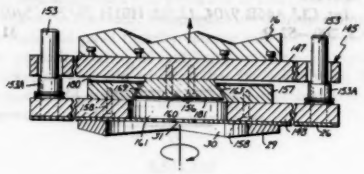
Romain H. Johnson, 925 6th St. SE., Minneapolis, Minn. 55414

Filed Sep. 29, 1982, Ser. No. 428,035

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.⁴ B23P *1/00*

U.S. Cl. 219—69 M **57 Claims**



1. A method of forming a complete die from a metal blank and a die set having an upper shoe, a lower shoe, and guide means mounting the upper shoe on the lower shoe whereby the upper shoe can be moved toward and away from the lower shoe in a linear direction comprising the steps of: severing a metal blank to form a rough-cut female die block having an opening therethrough whereby the portion of the blank defined within the opening forms a rough-cut male die punch block complementary thereto and spaced from the female block when centered therein, said severing forming adjacent rough-cut walls on said female block opening and said male block that are substantially parallel at any point therearound and tapered convergingly in the direction of intended die draft to define respective smaller and larger openings on said female block and end surfaces on said male block on either side thereof with the larger end surface of said male block greater in size than the smaller opening in the female block, said taper of the rough-cut walls being greater than the taper of the intended die draft covering the surface of the large end of the male punch block with conductive material, covering the surface of the large end of the male punch block with conductive material, covering the surface of the small end of the opening of the female die block with conductive material, securing said male block to an upper die set shoe with the larger end surface of the block spaced downwardly therefrom, securing said female block to a lower die set shoe with the smaller block opening spaced upwardly therefrom and with said female block in surrounding relation to said male block, aligning said die set shoes with said guide means for vertical relative movement in said linear direction so as to center the male block within the female block opening and with said male and female block walls in spaced relation, securing said upper die set shoe to an extractor capable of elevating said male block vertically, securing said lower die set shoe to a bed, drawing the male punch block vertically through the smaller die opening of the female die block in a direction in opposition to the

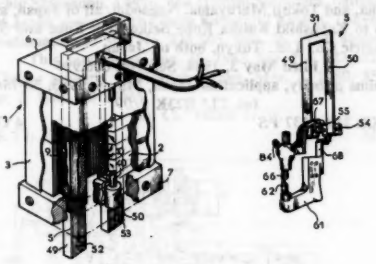
taper of the side walls of the punch block and die opening while simultaneously effecting material-removing erosion between the male die punch block and the female die block to generate preselected die clearance and die draft, and removing said conductive material from said surfaces of the male punch block and female die block after the material removing erosion has been completed.

4,544,821

WELDING APPARATUS USING TRANSFORMER WITH MOVABLE SECONDARY AND ITS METHOD OF MANUFACTURE AND USE

Bernard Humblot, 22, Chemin du Parc, 78580 Bazemont, France

Filed Apr. 19, 1982, Ser. No. 369,793
Claims priority, application France, May 12, 1981, 81 09404
Int. Cl.⁴ B23K *11/10*; H01F *21/04*
U.S. Cl. 219—91.2 **20 Claims**



4. A method of welding a workpiece with a welding apparatus having a transformer having a U-shaped secondary winding movable therein, and first and second electrodes each being electrically connected to one of the legs of the secondary winding; the method comprising the steps of:

(a) moving the first electrode towards the workpiece so as to contact the same, the first electrode being flexibly connected to one leg of the secondary winding;

(b) moving the second electrode towards the workpiece so as to contact the same, the second electrode being rigidly connected to the other leg of the secondary winding whereby the secondary winding within the transformer is guided by the movement of the secondary electrode; and

(c) effecting the weld.

4,544,822

ELECTRODE HOLDER FOR A RESISTANCE WELDING GUN

Harry T. Deininger, Vincentown, N.J., assignor to The Budd Company, Troy, Mich.

Filed Jun. 13, 1983, Ser. No. 503,922
Int. Cl.⁴ B23K *11/30*
U.S. Cl. 219—120 **1 Claim**

1. An electrode holder assembly comprising;

a. an "L" shaped main body disposed to be connected to a source of electrical power;

b. said main body being curved to a relatively narrow end portion to permit insertion into a relatively small area;

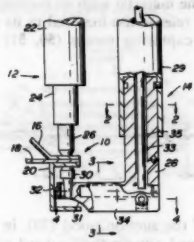
c. a replaceable tapered electrode cap disposed on the end of said main body to engage a workpiece during a welding operation and dimensioned to be knocked out when replacement is required;

d. means for supplying cooling fluid through said main body to cool said electrode cap;

e. said means for supplying cooling fluid including tubing means extending through said main body to circulate fluid close to said electrode cap;

f. an electrical material insulating within said electrode holder and surrounding a lower portion of said main body in close proximity to said electrode cap to prevent electrical arcing between said main body and said workpiece;

g. a relatively thin hard wear resistant shield material surrounding said electrical insulating material to protect said



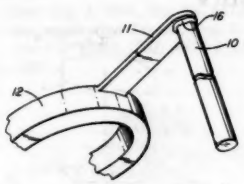
insulating material when said main body contacts said workpiece, whereby said electrode cap is movable into contact with the weld area of said workpiece without said main body directly contacting adjacent areas.

4,544,823

ARC PERCUSSION WELDING A PLATED PIN TO A THIN TAB OF DISSIMILAR METAL

George Tihanyi, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 27, 1983, Ser. No. 508,085
Int. Cl.⁴ B23K *9/00*
U.S. Cl. 219—121 PK **1 Claim**



1. A method of arc percussion welding an end of a tin plated pin, said pin composed of high copper content material, to a thin brass strip, including forming said end of said pin to a smooth substantially hemispherical profile prior to tin plating, the tin plating extending over said hemispherical profile.

4,544,824

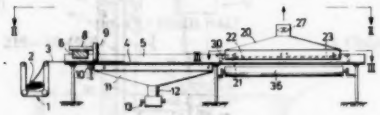
EQUIPMENT FOR HANDLING SHEET MATERIAL IN A PATTERN CUTTING MACHINE

Lars G. Knutsson, Järfälla, Sweden, assignor to Ingenjörsfirma G. Knutsson AB, Järfälla, Sweden

PCT No. PCT/SE83/00272, § 371 Date Mar. 2, 1984, § 102(e) Date Mar. 2, 1984, PCT Pub. No. WO84/00180, PCT Pub. Date Jan. 19, 1984
PCT Filed Jul. 4, 1983, Ser. No. 598,301
Claims priority, application Sweden, Jul. 5, 1982, 8204155
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LG **7 Claims**

1. Equipment for handling sheet material in a pattern cutting machine including means (9) for cutting workpieces from the material, a perforated worktable (4) disposed for supporting the material web (3), an inverted hood (11) adapted to extend over the underside of the perforated table surface, and fan means (13) connected to the hood (11), said means being adapted to establish a sub-pressure in said hood (11) for retaining the material web (3) on the table (4) during the cutting operation, characterized in that a suction hood (20) with a

perforated suction surface (21) facing towards the surface of the table and having a size substantially corresponding to that of the table, is adapted displaceable between a first position over the worktable (4) and a second position outside one rear edge of the table, in that the suction hood (20) is adapted to attract and lift the material with its suction surface in the first position, and to release the material in its second position, in that a material capturing means (50, 51) is disposed at the



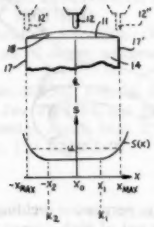
forward edge of the suction hood (20), in that a store (1) of material is arranged outside the forward edge of the table, in that the capturing means is adapted for coaction with the material on the table for pulling out a material web from the store (1) over the table (4) when the suction hood (20) moves to its second position and in that the fan means (13) of the inverted hood (11) is adapted for generating an excess pressure in said hood (11) for supporting the material web (3) on an air cushion when it is pulled out from the store over the table.

4,544,825

ADAPTIVE CONTROL SYSTEM FOR WELDING INVERTED SEAMS

George E. Cook, Brentwood, Tenn., assignor to CRC Welding Systems, Inc., Nashville, Tenn.

Filed Jan. 5, 1983, Ser. No. 455,893
Int. Cl.⁴ B23K 9/12
U.S. Cl. 219—137 R **33 Claims**



20. A method for welding an edge joint on a workpiece such as a turbine blade or the like, comprising the steps of:

moving an arc electrode along a path on the surface of the edge joint, said path defined by projecting a line from the end of the electrode to intersect perpendicularly with a point on the surface;

periodically holding the electrode vertically stationary while the electrode is moved laterally across the edge joint;

while the electrode is held vertically stationary, measuring a parameter of the arc and providing an arc signal having a magnitude related to the vertical distance between the electrode and the surface of the edge joint as the electrode is moved along the path;

repeatedly storing in a memory plurality of samples of the arc signal corresponding to a predetermined portion of the path of the electrode;

detecting an edge of the edge joint by comparing the stored arc signal samples to a reference value;

detecting when the electrode has been moved along the path to a predetermined distance from the detected edge of the edge joint;

reducing the welding current provided to the electrode while the electrode is within said predetermined distance and approaches the detected edge to prevent melting of the edge;

processing the stored samples of the arc signal so as to determine when the electrode has approached to within a second predetermined distance from the detected edge; and

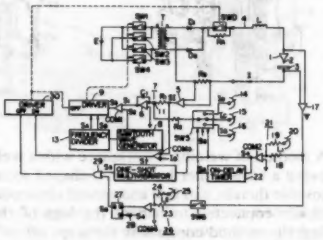
changing the direction of movement of the electrode along the path when the electrode has approached to within said second predetermined distance.

4,544,826

METHOD AND DEVICE FOR CONTROLLING WELDING POWER SUPPLY TO AVOID SPATTERING OF THE WELD MATERIAL

Sadao Nakanishi; Yoshihiro Nakajima; Hitoshi Kawano, all of Ise; Akihiko Ihochi, Odawara; Takaaki Ogasawara, Yokohama, and Tokuji Maruyama, Nagaodai, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe and Shinko Electric Co., Ltd., Tokyo, both of, Japan

Filed May 3, 1984, Ser. No. 606,996
Claims priority, application Japan, May 4, 1983, 58-78665
Int. Cl.⁴ B23K 9/09
U.S. Cl. 219—137 PS **4 Claims**



2. A method for controlling a consumable electrode inverter type welding power supply, characterized in that said method comprises:

controlling the output current of said power supply by on-off control of first switch means consisting of at least one switching element;

controlling a second switch means in a welding current attenuating path to be in the off-state when said first switch is in the off-state, said second switch means having an impednace means consisting of at least one impedance element in parallel with said second switch means; and

turning off said first and second switch means at least either in short circuiting condition with an electrode in contact with a work or upon detection of a premonition of re-arching;

so that said output current is no longer supplied and at the same time said impedance means further attenuates said current.

4,544,827

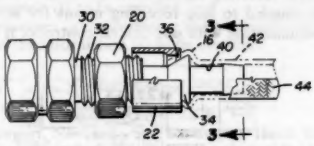
WELDING POWER CONDUCTOR ASSEMBLY

Joseph B. Cusick, III, Peck, Kans., assignor to Tweco Products, Inc., Wichita, Kans.

Filed Jun. 15, 1984, Ser. No. 620,855
Int. Cl.⁴ B23K 9/00
U.S. Cl. 219—137.63 **9 Claims**

1. In a welding gun apparatus having a handle and a means for communicating electrical power to a welding tip, the improvement comprising a means for securing electrical conductor wire to said assembly, wherein said securing means com-

prises a pressure nut which is rotationally movable against a connector sleeve so as to cause non-rotational movement of



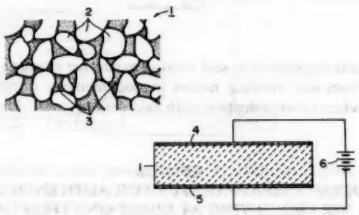
said sleeve against said conductor wire, whereby said conductor wire is secured within said sleeve without abrasion.

4,544,828

HEATING DEVICE

Michio Shigenobu, Tokyo, and Hiroshi Satomura, Saitama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 238,565, Feb. 26, 1981, abandoned.
This application Aug. 15, 1983, Ser. No. 523,622
Claims priority, application Japan, Mar. 3, 1980, 55-27064; Mar. 3, 1980, 55-27065
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—216 **32 Claims**



1. A heating device comprising:

a heat generating element including a non-organic binder having dispersed therein and in electrically contacting state ceramic particles which have PTC characteristics, said element being formed by pulverizing ceramic sintered so as to have PTC characteristics, dispersing said PTC particles in said binder, and being incorporated at a temperature lower than the sintering temperature so as integrally to form the element while retaining the binder therein; and electrical means for applying a voltage across said heat generating element to cause heat generation without dissipation of the binder, wherein said heating device provides a substantially uniform heat distribution.

4,544,829

ELECTRIC SOLDERING IRON HAVING A PTC HEATING ELEMENT

Shichiro Adachi, and Sho Kotani, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 296,444, Aug. 26, 1981, Pat. No. 4,468,555.
This application Feb. 10, 1984, Ser. No. 579,152
Claims priority, application Japan, Aug. 31, 1980, 55-123819[U]; Aug. 31, 1980, 55-123820[U]; Aug. 31, 1980, 55-123821[U]; Sep. 3, 1980, 55-125150[U]; Apr. 3, 1981, 56-48123[U]; May 7, 1981, 56-66055[U]
Int. Cl.[4] B23K *3/02*; H01C *7/02*; H05B *3/14*
U.S. Cl. 219—237 **3 Claims**

1. A soldering iron comprising:

an elongated bit with a cone shaped bit tip and an elongated back body having a generally rectangular cross-section;

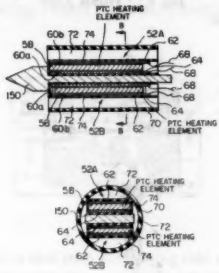
a pair of heater assemblies sandwiching the back body of the bit so as to be in thermal contact therewith;

lead wires coupled to said heater assemblies to supply power to the soldering iron; and

a hand-grip coupled with the bit;

each of said heater assemblies comprising a PTC thermistor having a positive temperature coefficient of resistance as a heater;

means for pressing said heater assemblies against the back body of the bit with spring contact;



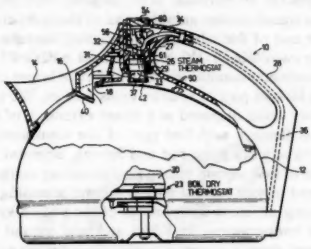
the total contact area S_1 between said PTC thermistors and said back body being in the range from 1.0 cm^2 to 25 cm^2 and the transverse cross sectional area S_2 of the back body being in the range from 0.1 cm^2 to 3.0 cm^2.

4,544,830

THERMOSTATICALLY CONTROLLED ELECTRIC KETTLE

Walter E. Miller, Barrie, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 3, 1984, Ser. No. 637,595
Claims priority, application Canada, Aug. 12, 1983, 434519
Int. Cl.[4] H05B *1/02*; A47J *27/21*
U.S. Cl. 219—328 **9 Claims**



1. In an electric kettle having a kettle body, an electrical heating means associated with said kettle body for heating liquid within said body, an open aperture located in an upper portion of the body above the liquid level therein for the substantially unrestricted passage of steam therethrough; thermally activated control means connected to said heating means in controlling relation therewith, including a temperature sensitive portion thereof located exteriorly of said body in enclosed relation in an upper portion of the kettle; the improvement comprising

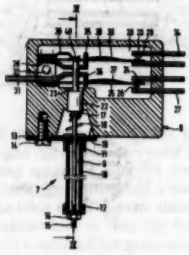
shield means interposed between said control means and the interior of said body to limit the transfer of heat to said temperature sensitive portion during operation of the kettle, and fluid diverter means located within the kettle adjacent said aperture to intercept a portion of steam flowing towards said aperture and to divert said portion towards said temperature sensitive portion of said control means to provide rapid heating thereof on the commencement of active boiling of liquid within the kettle.

4,544,831

HOT WARNING DEVICE FOR COOKING APPARATUS

Helmut Bayer, Vienna, Austria, assignor to Electrovac Fabrikation elektrotechnischer Spezialartikel Gesellschaft m.b.H., Vienna, Australia

Filed Jul. 6, 1984, Ser. No. 628,688
Claims priority, application Austria, Jul. 7, 1983, 2508/83
Int. Cl.⁴ H05B *3/68*
U.S. Cl. 219—449 **14 Claims**



1. In a device for "hot warning" and for regulating and limiting the temperature of radiation or contact heating bodies of electric heating apparatuses in combination with heating surfaces made of metal, glass, ceramics and the like, in which an outer end of a temperature sensor is arranged between the heating body and the cooking surface in order to regulate and limit the temperature of the heating body, said sensor having a rod made of a material with a high coefficient of thermal expansion disposed in a tube made of a material of a low coefficient of thermal expansion, said device including a switch head, an inner end of the rod extending to the switch head and being in communication via a transmission member with a switch system, the switch system serving for the regulating and limiting of the temperature of the heating body and for operation of a signal device, an outer end of the rod being joined to an outer end of the tube, an inner end of the tube connecting with the switch head, the improvement wherein

the transmission member has a first part of larger cross section and a second part of smaller cross section, the transmission member being disposed as a direct extension of the rod and coaxial thereto, said first part of the transmission member directly adjoining the rod and having, adjacent a transition region to said second part, a first actuating surface and, on a free end of said second part, a second actuating surface for actuating different components of the switch system at different temperatures, said first and said second parts being disposed about a common axis for transmitting a force of said rod directly along said axis to said components of said switch system.

4,544,832

CARD READER WITH BUFFER FOR DEGRADED MODE

Jorge A. Young, and Bhupendra J. Khandwala, both of Claremont, Calif., assignors to Figgie International, Inc., Richmond, Va.

Continuation of Ser. No. 412,269, Aug. 27, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,898
Int. Cl.⁴ G06C *15/00*
U.S. Cl. 235—377 **38 Claims**

1. A card reader for use in a security system having a central controller which communicates with said card reader, said card reader comprising:

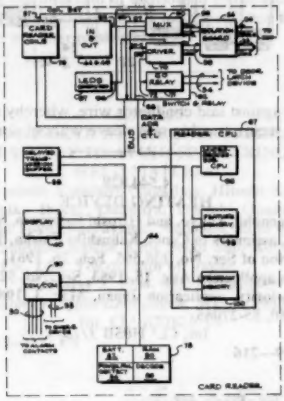
a memory;

means for reading data stored permanently on cards;

means for evaluating data from the cards independent of the central controller, and for selectively permitting access to a controlled location in response to the evaluation of the data from the cards, with the card data remaining unchanged on the cards;

means for receiving signals from said central controller;

means coupled to said receiving means for sensing when communication with said central controller is lost; and



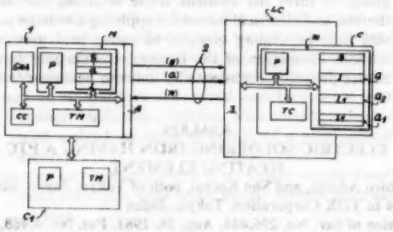
means responsive to said sensing means for storing said data from said reading means in said memory during times when communication with said central controller is lost.

4,544,833

PROCESS AND APPARATUS FOR AUTHENTICATING OR CERTIFYING AT LEAST ONE ITEM OF INFORMATION CONTAINED IN A MEMORY OF A REMOVABLE AND PORTABLE ELECTRONIC CARRIER, SUCH AS A CARD

Michel Ugon, Maurepas, France, assignor to CII Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 20, 1983, Ser. No. 486,671
Claims priority, application France, May 14, 1982, 82 08405
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 235—379 **33 Claims**



1. A process of authenticating or certifying at least one item of information (I) contained in a memory of a portable electronic card adapted to be connected to an apparatus (I) that ensures the transfer of information with the card (C), comprising:

(a) causing the execution in card (C) and in the apparatus (I) of an identical program (P) that performs an algorithm leading to the calculation of a result (R) within the card and of a result (R') within the apparatus;

(b) comparing the results (R) and (R'), an agreement between these two results proving the authentication of the information (I),

(c) causing said algorithm to take account during the execution of said program a parameter

(i) representing an item of data which is correlated to the information (I) to be certified, and

(ii) a parameter (a) representing the position in the memory of the information (I) to be certified.

4,544,834

MEMORY DEVICE

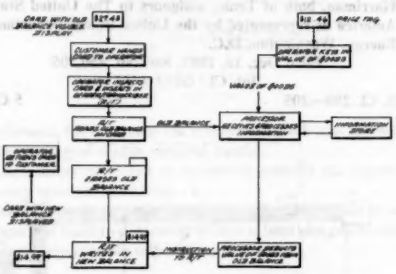
Derek J. Newport, Newcastle, and Christopher Hood, Reading, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Continuation of Ser. No. 353,490, Mar. 2, 1982,. This application Apr. 18, 1984, Ser. No. 601,107

Claims priority, application United Kingdom, Mar. 4, 1981, 8106820

Int. Cl.⁴ G06K *19/01*

U.S. Cl. 235—487 **26 Claims**



1. A portable credit device for use in a service system, said device including a display, said display including a plurality of respective segments arranged in a pattern, each of said segments including:

an electrochromic cell containing a solid electrolyte and a transition metal oxide which can colour cathodically by reduction or anodically by oxidation to store readable information, and

electrical connecting means for applying an electrical signal of a first polarity to said cell to produce a visible persistent colour in said cell, said colour remaining visible in the absence of the said signal, for applying an electrical signal of a second polarity different from said first polarity to said cell to change the colour of said cell, and for connecting a standing voltage produced by said cell indicating the state of said cell.

4,544,835

DATA SYSTEM CONTAINING A HIGH CAPACITY OPTICAL CONTRAST LASER RECORDABLE WALLET-SIZE PLASTIC CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, , which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Nov. 21, 1984, Ser. No. 673,572

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

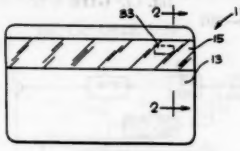
Int. Cl.⁴ G06K *19/00*

U.S. Cl. 235—487 **6 Claims**

1. A system for sequentially recording transaction data by means of a laser comprising,

a wallet size card with a transparent plastic laminating material protectively bonded to a strip of high resolution direct-read-after-write optically reflective read laser recording material adhered to one side of the card, being laser recordable in place on said card and having a minimal laser recording capacity of 250,000 binary bits, having laser created data spots in a surrounding optically contrasting field of said strip, representing accumulated transaction data, with a dimension of said spots being less than 25 microns, the optical reflective contrast ratio of said spots with respect to the surrounding field being at least two to one,

laser means having a beam disposed in laser writing relation



with respect to said strip for writing said spots, representing transaction data, the spots having a size of less than 25 microns,

a light detector means disposed in reading relation with respect to said strip for reading said spots, and

means for providing relative motion between the laser beam and the card for sequentially reading transaction data on the card and writing transaction data onto said card in a permanent manner.

4,544,836

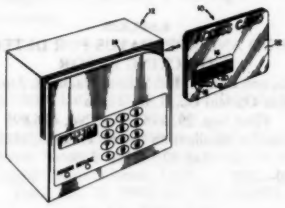
OPTICALLY-BASED ACCESS CONTROL SYSTEM

Aaron A. Galvin, Lexington; Roy L. Harvey, Milton, and Kenneth J. Leff, Halifax, all of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,308

Int. Cl.⁴ G06K *19/00*

U.S. Cl. 235—487 **15 Claims**



1. An optically-based coded card identification system comprising:

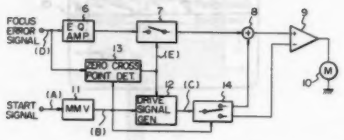
a card having adjacent differently polarized elements defining a code; and

a reading head for automatically decoding said card upon passage of said card past said head, said head having a channel through which said card is passed including means for illuminating said elements, means polarized in a predetermined direction for detecting polarized light from said elements and for producing an output signal responsive to light from a polarized element polarized in said predetermined direction arriving at said detecting means, and means for decoding the code represented by the output signal from said polarized detecting means.

4,544,837
FOCUS SERVO CONTROL DEVICE FOR AN OPTICAL SYSTEM HAVING AN INITIAL FOCUS LOCKING OPERATION

Megumi Tanaka, and Ryuichi Naito, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,456
Claims priority, application Japan, Dec. 25, 1981, 56-197695[U]
Int. Cl.⁴ G11B 7/12
U.S. Cl. 250—201 **5 Claims**



1. A focus servo control device for an optical system having a focus servo loop including (i) an objective lens movable between a nearest position and a farthest position relative to an object, (ii) a focus error signal generator for producing a focus error signal including at least first and second in-focus signals in relation to a relative distance between the objective lens and the object, said first in-focus signal being produced when said relative distance is substantially at a first value and indicating a real in-focus state, said second in-focus signal being produced when said relative distance is substantially at a second value greater than said first value, and corresponding to an out of focus state, and (iii) a focusing device for positioning the objective lens in response to the focus error signal, the focus servo control device comprising:

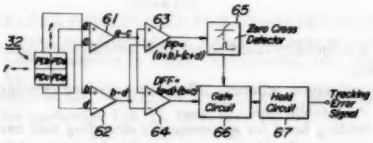
a first means for opening the focus servo loop and for positioning said objective lens at said farthest position; and

a second means responsive to the focus error signal for moving the objective lens from the farthest position towards the nearest position, and for subsequently moving said objective lens from the nearest position towards the farthest position and closing the focus servo loop upon receipt of the first in-focus signal without respect to said second in-focus signal while said objective lens is moved from said nearest position toward said farthest position.

4,544,838
METHOD AND APPARATUS FOR DETECTING TRACKING ERROR

Toru Musha, and Kenichi Ito, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Sep. 29, 1982, Ser. No. 426,895
Claims priority, application Japan, Oct. 30, 1981, 56-172966
Int. Cl.⁴ G05B 1/00
U.S. Cl. 250—202 **15 Claims**



1. A method for detecting a tracking error in a light spot projected by an objective lens onto a record medium with respect to an information track formed by a pit array extending along a tangential direction and viewed in a direction perpendicular to an optical axis of the objective lens as well as to the information track comprising:

introducing a light flux, which is derived from the light spot projected onto the record medium, onto a light detector arranged in a far field of the information track and having at least two light receiving regions divided along a direction corresponding to the tangential direction of the information track to produce photoelectrically converted outputs;

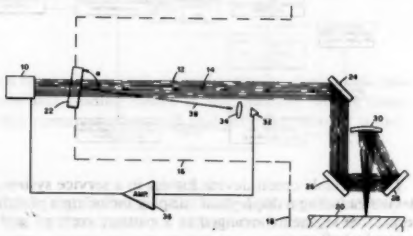
deriving a difference signal between said outputs; and

producing a tracking error signal by sampling said difference signal in response to a timing signal representing the positioning of said light spot at substantially the center of a pit along said tangential direction of the information track, to extract those portions of the difference signal which occur during time intervals that correspond in time to said light spot being located at substantially the center of a pit in said tangential direction.

4,544,839
LASER BEAM MONITORING SYSTEM

Bradley S. Weil, Knoxville, and Grady R. Wetherington, Jr., Harriman, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1982, Ser. No. 450,305
Int. Cl.⁴ G01J 1/32
U.S. Cl. 250—205 **5 Claims**



1. A system for monitoring a laser beam, comprising:

a laser cell directing a laser beam along a first path;

a mirror positioned to intercept said laser beam traveling along said first path and deflect it toward an object;

a laser-transparent plate positioned on said first path between said laser cell and said mirror so that said laser beam passes therethrough, said plate being inclined relative to said first path, light which travels from said object to said mirror and thence along said first path being deflected from said plate along a second path diverging from said first path;

a light-responsive sensor for sensing said light traveling along said second path and generating an output signal when said light is cut off; and

means responsive to said output signal for terminating the operation of said laser cell.

4,544,840
FIBER OPTIC FLUID IMPURITY DETECTOR

Christian A. Keller, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 271,640, Jun. 8, 1981, Pat. No. 4,443,699, which is a division of Ser. No. 71,704, Aug. 31, 1979, Pat. No. 4,319,484. This application Feb. 6, 1984, Ser. No. 577,569
Int. Cl.⁴ G02B 5/14
U.S. Cl. 250—227 **6 Claims**

1. Apparatus for detecting the presence of at least one of a plurality of possible impurities having known energy absorption characteristics in a fluidic medium, comprising:

a source of electromagnetic energy,

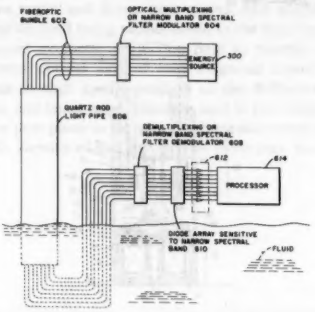
an energy conveying element immersed in the fluidic medium,

means for spectrally filtering the energy from the source into

signals at each specific wavelength at which each corresponding impurity absorbs maximum energy,

a multiplexer means for multiplexing each provided specific wavelength signal into the energy conveying element in spectral bands,

means, coupled to the output from the energy conveying



element, for receiving the response of each specific wavelength signal within spectral bands,

an amplifier connected to separately amplify the signals at each spectral band, and

means for analyzing the specific wavelength signals in each spectral band to determine which at least one of the corresponding possible impurities are present.

4,544,841

DETECTOR DEVICE FOR A CONVEYOR

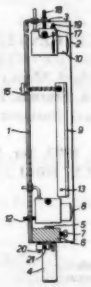
David E. Bright, Sevenoaks, and Steven K. Jones, Billericay, both of England, assignors to Post Office, London, England

Filed Mar. 21, 1983, Ser. No. 477,403

Claims priority, application United Kingdom, Mar. 19, 1982, 8208175

Int. Cl.⁴ G01V *9/04*

U.S. Cl. 250—221 **9 Claims**



1. A detector device for detecting the passage of articles on a conveyor, said detector device comprising an energy source element, an energy responsive element and reflector means positioned relative to said energy source element and said energy responsive element such that a beam of energy transmitted between the source element and the responsive element first traverses the conveyor path substantially parallel to and adjacent to the conveyor surface and is then reflected back and forth across the conveyor path in a plane substantially perpendicular to the conveyor surface such that the reflections of the beam after the initial reflection are at greater angles of incidence than the initial reflection.

4,544,842

DOCUMENT SCANNING APPARATUS COMPRISING A LIGHT CONDUCTOR BLOCK

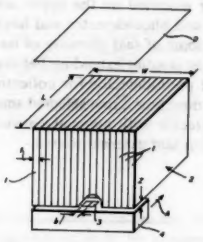
Detlef Engemann, Oberursel; Dieter Fischer, Frankfurt, and Karl-Heinz Vatterott, Duderstadt, all of Fed. Rep. of Germany, assignors to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,623

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3211380

Int. Cl.⁴ G02B *5/14*

U.S. Cl. 250—227 **5 Claims**



1. Document scanning appartus for supporting and scanning a stationary document comprising

a stationary light conductor block having a top side whose length and width corresponds to that of a document for directly supporting said document thereon for scanning,

said light conductor block comprising a plurality of joined light conductors oriented to transmit light in vertical planes,

a line array of image sensors spaced from the underside of said light conductor block for movement along and parallel to the underside of said light conductor block in direction of the length of said light conductor block,

each of said light conductors having a width corresponding to the width of an image sensor in said line array, and

a light source movable together with said line array of image sensors and positioned to illuminate a strip of said supported document opposite said line array of image sensors and having a height corresponding to the length of image sensors in said line array.

4,544,843

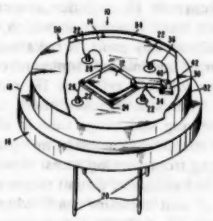
RADIATION DETECTOR WITH BUILT-IN TEST CAPABILITY

Mark T. Kern, Goleta, Calif.; Robert A. Bell, Salem, N.H., and Max J. Riedl, Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jan. 28, 1983, Ser. No. 461,896

Int. Cl.⁴ H01J *5/02*

U.S. Cl. 250—239 **15 Claims**



1. A device for detecting external electromagnetic radiation

and generating electrical signals in response thereto comprising:

a base member having an upper and lower surface and having a plurality of electrical terminals;

a photodetector mounted on the upper surface of said base member and having electrical connections to corresponding ones of the terminals;

an opaque enclosure mounted on the base member for enclosing the photodetector, the enclosure including a transparent window spaced from but adjacent to the photodetector for admitting light from an external source to the photodetector wherein said external source is located outside of said enclosure;

a light emitter mounted on the upper surface of said base adjacent to said photodetector and having electrical connections to some of said plurality of terminals; and

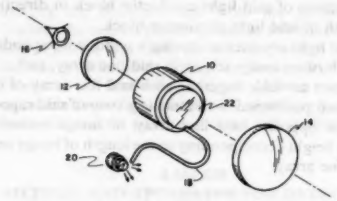
a prismatic light conduit extending between said light emitter and said photodetector for collecting light from the emitter and directing it to a selected small portion only of the photodetector with minimal obstruction of said light admitted from said external source.

4,544,844

IMAGE TUBE IR ILLUMINATOR INDICATOR

Thomas E. Moyers, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1983, Ser. No. 547,522
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—330 **6 Claims**



1. An IR illuminator indicator in an IR to visible imaging system, said indicator comprising:

an IR radiation source in an IR illuminator;

an image tube having switchable means for switching said IR radiation source on and off; and

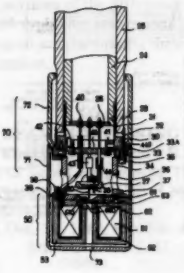
a fiber optics guide means having an input end and an output end respectively connected between the proximity of said IR radiation source and an input faceplate of said image tube for directly channeling a small portion of the IR radiation from said IR radiation source to an indicator mark on said input faceplate in which said IR radiation source simultaneously emits IR radiation straight forward toward a target and into said input end of said fiber optics guide means wherein reflected IR radiation from said target and from said indicator mark is detected by an observer viewing said image tube in which any sudden gain of said image tube caused by an operator of the image tube changing from viewing a near view highly reflective target to a less reflective distant target area enhances the brightness of said indicator mark when compared with said reflected IR radiation being observed and said IR radiation source may be turned off to prevent possible enemy detection in said distant target area.

4,544,845

ELECTRON GUN WITH A FIELD EMISSION CATHODE AND A MAGNETIC LENS

Troyon E. Michel, Reims, France, assignor to University de Reims Champagne Ardenne, Reims, France

Filed May 13, 1983, Ser. No. 494,574
Claims priority, application France, May 24, 1982, 82 08952
Int. Cl.[4] H01J *37/73*
U.S. Cl. 250—396 R **14 Claims**



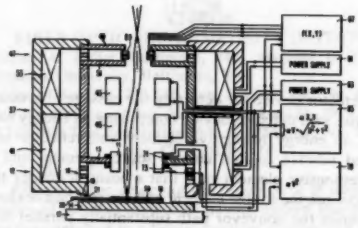
1. An electron gun, comprising a field emission cathode, focusing members having a magnetic lens which are positioned in the vicinity of the cathode, and means for accelerating electrons comprising at least one anode which is brought to a selected potential, the magnetic lens being defined by a coil, a magnetic circuit and a pole piece in two parts having an air gap therebetween, the magnetic lens being positioned coaxially to the coil on the side of the field emission cathode and the two-part pole piece presenting electron inlet and outlet axial orifices, said magnetic lens being adapted to assume the electron extractor potential, wherein said electron inlet orifice, nearer the cathode, has a diameter smaller than that of the outlet orifice, these diameters both being less than about 10 mm, the air gap between the two parts of the pole piece, along the axis of the coil, is less than about 3 mm, and the distance between the median plane of this air gap and the nearest end of the cathode is less than about 5 mm.

4,544,846

VARIABLE AXIS IMMERSION LENS ELECTRON BEAM PROJECTION SYSTEM

Günther O. Langner, Westford, Mass.; Hans C. Pfeiffer, Ridgefield, Conn., and Maris A. Sturans, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1983, Ser. No. 508,645
Int. Cl.[4] H01J *3/20*
U.S. Cl. 250—396 ML **17 Claims**



1. A variable axis immersion lens for an electron beam projection system comprising:

magnetic immersion lens means for producing a magnetic

field to focus an electron beam, said magnetic immersion lens means including an upper pole piece having a predetermined bore, a lower pole piece having a non-zero bore section and a zero bore section, and means for inserting a target between said upper pole piece and said zero bore section of said lower pole piece; and

magnetic compensation means for producing a magnetic compensation field between said magnetic immersion lens means upper and lower pole pieces, said magnetic compensation field being proportional to the first derivative of the axial magnetic projection field to thereby cause the electron optical axis of said magnetic immersion lens means to shift to the position of the deflected electron beam, and being approximately zero in the vicinity of said lower pole piece to thereby eliminate stray magnetic fields in the vicinity of said lower pole piece zero bore section.

4,544,847

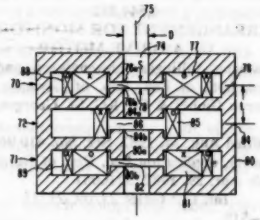
MULTI-GAP MAGNETIC IMAGING LENS FOR CHARGED PARTICLE BEAMS

Norman J. Taylor, Wenham, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 28, 1983, Ser. No. 518,167

Int. Cl.⁴ H01J *3/22*

U.S. Cl. 250—396 ML **19 Claims**



1. A magnetic lens for imaging a charged particle beam, said lens comprising:

first magnetic means for providing a first focusing magnetic field along the axis of said beam;

second magnetic means spaced along the axis of said beam from said first magnetic means for providing a second focusing magnetic field which has the opposite polarity from said first focusing magnetic field, said first and second focusing magnetic fields being operative, when varied together, to focus said beam without substantial change in beam rotation;

third magnetic means positioned along the axis of said beam between said first magnetic means and said second magnetic means, for providing a rotation magnetic field which can be varied in order to rotate said beam without substantial change in magnification or focus; and

compensation means associated with said first and second magnetic means and operative to reduce said first and second focusing magnetic fields as said rotation magnetic field is increased.

4,544,848

PHOTO-ELECTRIC CONVERSION DEVICE WITH ACCUMULATION TIME CONTROL AND LEAKAGE CURRENT COMPENSATION

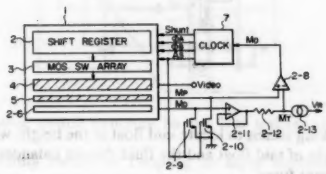
Masahiro Kawasaki; Harumi Aoki, and Koji Suzuki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 345,122, Feb. 2, 1982, Pat. No. 4,479,062. This application Mar. 27, 1984, Ser. No. 593,991

Claims priority, application Japan, Feb. 6, 1981, 55-16355; Feb. 6, 1981, 55-16356

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—578 **3 Claims**



1. A photo-electric conversion device, comprising:

a light receiving element array for accumulating information on incident light through an accumulation effect;

means for scanning said light receiving element array;

a first light receiving element provided adjacent said light receiving element array and providing an output signal;

a second light receiving element provided adjacent said first light receiving element and providing an output signal, said second light receiving element being shielded from light;

comparison means for comparing output signals from said first and second light receiving elements; and

means for controlling an accumulation time of said light receiving element array in accordance with the comparison of output signals from said first and second light receiving elements to compensate for a leakage current in said first light receiving element.

4,544,849

METHOD AND APPARATUS FOR TIDAL ELECTRIC POWER GENERATION USING THE BUOYANCY ENERGY OF THE TIDE

In K. Choi, 596-13 Dae Hung Dong, Po Hang City, Keong Sang Buk Do, D.P.R. of Korea

Filed Aug. 18, 1983, Ser. No. 524,329

Claims priority, application D.P.R. of Korea, Mar. 26, 1980, 80-1238

Int. Cl.⁴ F03B *13/12*

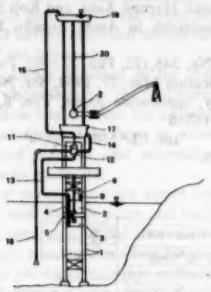
U.S. Cl. 290—53 **9 Claims**

1. An electric power generating apparatus using the buoyancy energy of tide comprising:

(a) a float driven by the rise and fall of a body of water and adapted to be filled with a fluid,

(b) valve means to continuously fill or empty said float during a substantial portion of the path between its extreme limits of travel,

(c) conic helical gear transmission means between said float and a pump driven by said float,



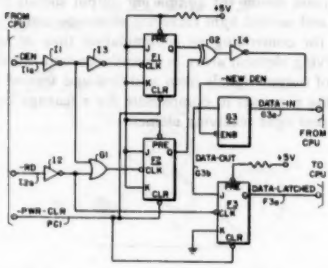
(d) locking means to locate said float at the height where the weight of said float and the fluid therein balances with its buoyant force.

4,544,850

RACE CONDITION MEDIATOR CIRCUIT

George K. Tarleton, Itasca, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 5, 1983, Ser. No. 558,227
Int. Cl.[4] H04L *7/04*; H03K *19/08*
U.S. Cl. 307—269 11 Claims



1. A race condition mediator circuit for use in a processing system which includes a processing unit and a data unit, said processing unit being operative to provide a data request signal and a clock signal, and said data unit being operative to provide a data signal in response to said data request signal, said race condition mediator circuit comprising:

timing means connected to said processing unit and operative in response to said data request signal to provide a data enable signal;

first gating means connected between said timing means and said data unit and operative in response to said data enable signal and said data signal to provide a gated data signal; and

output storage means connected to said first gating means and said processing unit and operative in response to said clock signal and said gated data signal to provide a latched data signal;

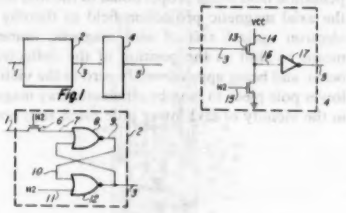
said timing means being further operative in response to an absence of said data request and clock signals to inhibit said data enable signal.

4,544,851

SYNCHRONIZER CIRCUIT WITH DUAL INPUT

Marvin Conrad; Karl M. Guttag; John V. Schabowski, all of Houston, Tex.; Derek Roskell, Northants, England; Jim A. Carey, Bedford, England, and Brian Shore, Beds, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1981, Ser. No. 298,035
Int. Cl.[4] H03K *17/30, 19/096, 17/693*
U.S. Cl. 307—480 14 Claims



1. A digital synchronizer for connection to a synchronous system to prevent the propagation of a metastable condition, the digital synchronizer comprising:

input means for receiving of an input signal which comprises one of an input voltage level signal and an input pulse signal and to provide a voltage level as an output signal;

latch means having a latch input connected to the output of said input means for storing the output signal thereof;

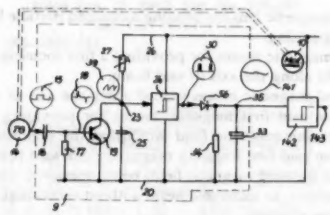
output means having an input coupled to the output of the latch means for producing an output signal at an output terminal only when the output signal of the latch means has a voltage magnitude which exceeds a predetermined threshold value which is greater than the metastable voltage value of the latch means.

4,544,852

CIRCUIT ARRANGEMENT FOR MONITORING SPEED OF A DRIVE MOTOR

Helmut Moosmann, Villingen-Schwenningen, and Rolf Müller, St. Georgen, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 410,969
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133725; Apr. 29, 1982, 3216001
Int. Cl.[4] G01R *23/09, 23/15*
U.S. Cl. 307—519 32 Claims



1. Circuit arrangement for monitoring the speed of a drive motor, comprising detection means for producing an input signal sequence having a speed-dependent repetition frequency, a signal converter for converting the input signal sequence into an output signal the amplitude of which is a function of the repetition frequency of the input signal sequence, and an evaluation circuit having at least one threshold value means responsive to the output signal for providing an

alarm signal when the amplitude of the output signal reaches a value corresponding to a drop of the motor speed below a predetermined minimum speed, said evaluation circuit having a Predetermined response delay exceeding the acceleration time of the motor to prevent provision of said alarm signal during motor start-up.

4,544,853

INTEGRATED COMPARATOR CIRCUIT

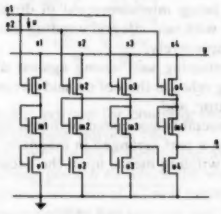
Mathew Neal, Freiburg, and Jochen Reimers, Gundelfingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jan. 4, 1983, Ser. No. 455,447

Claims priority, application European Pat. Off., Feb. 6, 1982, 82100870.3

Int. Cl.⁴ H03K *5/24*

U.S. Cl. 307—530 **4 Claims**



1. An integrated comparator circuit comprising a plurality of insulated-gate field effect transistors of the same conductivity type, said circuit being responsive to the potential difference between first and second input terminals to provide an output signal at an output terminal, said circuit comprising:

a first circuit branch comprising first, second and third transistors having their controlled current paths serially connected between a voltage source and a zero point for said current;

a second circuit branch comprising fourth, fifth and sixth transistors having their controlled current paths serially connected between said voltage source and said zero point;

a third circuit branch comprising seventh, eighth and ninth transistors having their controlled current paths serially connected between said voltage source and said zero point;

a fourth circuit branch comprising tenth, eleventh and twelth transistors having their controlled current paths serially connected between said voltage source and said zero point;

the gate of said first transistor and the gate of said seventh transistor both being connected to said first input terminal;

the gate of said fourth transistor and the gate of said tenth transistor both being connected to said second input terminal;

the gate of said second transistor being coupled to the junction between said first and second transistors; the gate of said eighth transistor being connected to the junction between said seventh and eighth transistors;

the gates of said fifth and eleventh transistors both being connected to the junction between said tenth and eleventh transistors;

the gates of said third and said sixth transistors being coupled to the junction between said second and third transistors;

the gate of said ninth transistor being connected to the junction between said fifth and sixth transistors;

the gate of said twelfth transistor being connected to the junction between said eighth and ninth transistors; said output terminal connected to the junction of said eleventh and twelfth transistors.

4,544,854

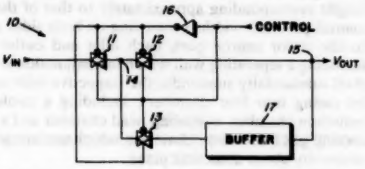
ANALOG SWITCH STRUCTURE HAVING LOW LEAKAGE CURRENT

Richard W. Ulmer, and James A. McKenzie, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 4, 1983, Ser. No. 520,361

Int. Cl.⁴ H03K *17/16, 17/687*

U.S. Cl. 307—576 **10 Claims**



1. An analog switch structure having low leakage current comprising:

first switching means for coupling an input terminal to a node in response to a control signal means;

second switching means connected to the node for coupling the node to an output terminal in response to said control signal means;

buffer means having an input connected to the output terminal, and an output for providing a buffered output signal; and

third switching means connected between the node and the output of the buffer means, inversely responsive to said control signal means, for connecting the buffered output signal to the node.

4,544,855

GAS COOLED ALTERNATING CURRENT MACHINE

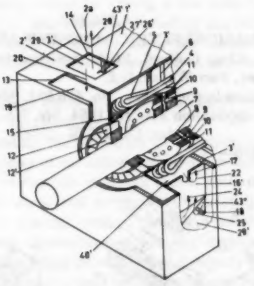
Herbert Prenner, Windisch, and Paul Schröder, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 5, 1984, Ser. No. 586,394

Claims priority, application Switzerland, Mar. 10, 1983, 1304/83

Int. Cl.⁴ H02K *9/00*

U.S. Cl. 310—59 **7 Claims**



1. A gas cooled alternating current machines having a motor mounted on a shaft and surrounded by a stator, said rotor and said stator each having opposed ends, said stator having a stator central part including a laminated sheet metal pack and two stator end parts, a fan attached to said shaft at each rotor end and a shell mounted in association with the fan for conveying a cooling medium towards said stator and said rotor, the stator sheet metal pack being clamped between two end plates and subdivided by radially extending cooling ducts into individual partial packs, the stator sheet metal pack being sur-

rounded by a casing having walls defining plural corners, comprising:

plural upper and lower ducts for the removal of the cooling gas formed in respective of the casing corners, said ducts bounded only by the walls of the casing and surfaces of the sheet metal pack separated by the sheet metal pack and extending over the total length of the sheet metal pack;

the stator end parts formed both as cooling gas inlet and cooling gas outlet casings, said stator end parts having a height corresponding approximately to that of the stator central part and widths protruding on both sides relative to the stator central part, each inlet and outlet casing including a separating wall which in conjunction with said shell substantially subdivides the respective inlet and outlet casing into four chambers, including a cooling gas induction chamber, a winding head chamber and a pair of cooling gas outlet flow chambers which are located symmetrically about a vertical plane;

each cooling gas outlet flow chamber having at least one outlet flow opening and each being connected to a respective lower duct and a respective upper duct of the stator central part via openings in the end plates of the stator central part;

said separating walls in each stator end part between the winding head chamber and the cooling gas outlet flow chambers being located in pairs symmetrically about the vertical plane and separating the winding head chamber and the cooling gas outlet flow chambers from one another; and

said separating walls having by-pass openings through which cooling gas is led in a first cooling branch through the rotor and stator and in a second cooling branch in parallel to the first cooling branch through the stator winding head;

said separating walls in the stator end parts extending in an axial direction from the end plates to the shell allocated to the fans;

said separating walls defining a cross-section which at most coincides approximately with the external contour of the stator metal sheet and at least lies outside a hypothetical cylinder obtained by a circle inscribed on the sheet metal pack external contour; and

said separating walls contacting a respective internal side of the lower and upper casing wall of the stator end parts and including by-pass openings approximately evenly distributed over the periphery thereof.

4,544,856

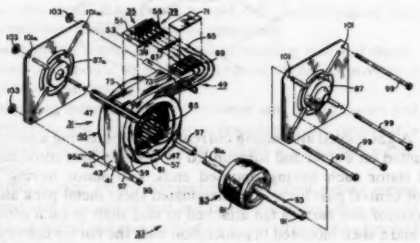
DYNAMOELECTRIC MACHINE AND STATOR

James L. King, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 496,552, May 20, 1983,. This application Feb. 15, 1984, Ser. No. 580,384

Int. Cl.⁴ H02K *15/00*

U.S. Cl. 310—71 **25 Claims**



1. A dynamoelectric machine comprising:

a stationary assembly including a stator having a pair of opposite end faces with a circumferential surface interposed therebetween;

winding means associated with said stator and adapted for excitation, said winding means including a pair of opposite generally annular groupings of end turns arranged adjacent said opposite end faces of said stator and with said opposite end turn groupings having an outer circumferential portion, and a set of integral winding leads extending from generally the same preselected location in one of said end turn groupings generally beyond and across at least a part of said outer circumferential portion thereof, respectively;

means for terminating said integral winding leads including a casing disposed at least in part in seating relation with said circumferential surface of said stator at least adjacent one of said opposite end faces thereof, a set of terminals secured to said casing, at least one electrical connector section on at least some of said terminals with said at least one electrical connector section on said at least some terminals being interconnected in direct terminating engagement with said integral winding leads of said winding means, respectively;

means for retaining said casing against displacement from the seating relation thereof on said circumferential surface of said stator; and

a rotatable assembly associated with said stationary assembly and having a part arranged in magnetic coupling relation with said winding means upon the excitation thereof.

4,544,857

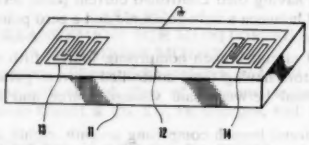
HIGH ELECTROMECHANICAL-COUPLING COEFFICIENT SURFACE ACOUSTIC WAVE DEVICE

Hiroshi Shimizu, and Yasuyuki Mizunuma, both of Miyagi, Japan, assignors to NEC Corporation, Japan

Filed Aug. 29, 1983, Ser. No. 527,707

Int. Cl.⁴ H03H *9/25*

U.S. Cl. 310—313 B **7 Claims**



1. A high electromechanical coupling surface acoustic wave device comprising a rotated Y-cut lithium niobate crystal substrate for propagating a Love wave mode along a propagation path, and a thin high density film formed on said propagation path on said substrate and having a thickness that reduces the electromechanical coupling coefficient of Rayleigh waves to zero.

4,544,858

PIEZOELECTRIC MECHANISM FOR CONVERTING WEIGHT INTO FREQUENCY

Yuzuru Nishiguchi; Shigeru Uchiyama, and Masaaki Kobayashi, all of Tokyo, Japan, assignors to Shinko Denshi Company Limited, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,050

Claims priority, application Japan, Jun. 30, 1983, 58-117114

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—321 **8 Claims**

1. A mechanism for converting a weight into a frequency comprising:

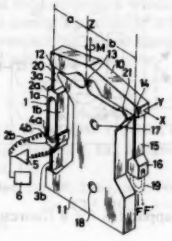
a tuning fork vibrator including a pair of elongated plate-like vibrating strips extending in parallel with each other and a pair of bridging portions for coupling the vibrating strips with each other at their both ends, a natural resonance frequency of the tuning fork vibrator being changed in

response to the weight applied there to in an axial direction of the tuning fork vibrator;

a lever unit having a power pivot, a load pivot and a fulcrum pivot;

a base portion having major surfaces extending in the axial direction of the tuning fork vibrator and connected to the fulcrum pivot of the lever unit;

a first plate-like portion for coupling one of the bridging portions with the power pivot of the lever unit;



a second plate-like portion for coupling the other bridging portion with the base portion; and

a third plate-like portion for coupling the load pivot with a weight receiving portion to which the weight to be converted is applied; wherein all of said tuning fork vibrator, lever unit, base portion, first, second and third thin plate-like portions are formed integrally from a single plate in such a manner that the elongated plate-like vibrating strips extend perpendicularly to a major surface of said plate.

4,544,859

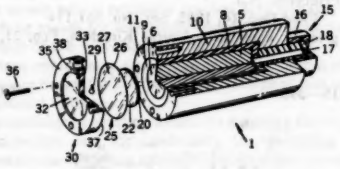
NON-BONDED PIEZOELECTRIC ULTRASONIC TRANSDUCER

James M. Eoff, Arvada, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 6, 1984, Ser. No. 628,078

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—335 **20 Claims**



1. A mechanically assembled non-bonded ultrasonic transducer comprising:

a substrate having a polished, electrically conductive, end surface;

a piezoelectric film having first and second opposed sides, said first side being in contact with, but not adhered to, said surface;

a first wetting agent covering said second side of said film;

a thin metal electrode having first and second opposed sides, said first side being in contact with, but not adhered to, said second side of said film through said first wetting agent; a second wetting agent covering said second side of said electrode; and

a lens assembly comprising:

a lens having a polished first surface in contact with said second side of said electrode through said second wetting agent and

clamp means for mechanically clamping said lens against said electrode, said electrode against said film and said film against said substrate.

4,544,860

LAMINATED CHANNEL PLATE ELECTRON MULTIPLIER

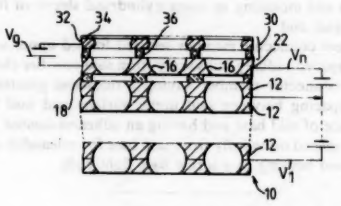
Andrew J. Guest, Crawley, and Derek Washington, Wallington, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,667

Claims priority, application United Kingdom, Oct. 19, 1981, 8131399

Int. Cl.⁴ H01J *43/10, 43/28*

U.S. Cl. 313—103 CM **18 Claims**



1. A laminated channel plate electron multiplier, comprising:

a stack of electrically-conductive sheet dynodes, the dynodes being insulated and separated from one another by insulating separators, the stack having channels passing through the stack from an outer surface of an input dynode to an output dynode, the input dynode being separated and insulated from the immediately adjacent dynode by an insulating separator having a first substantially uniform thickness, each channel including aligned apertures formed by walls in the dynodes, the apertures having maximum cross-sectional dimensions which are substantially the same;

exposed secondary electron emissive surfaces provided on the walls of the apertures, and

means for enabling the provision of an electron repelling field in a vicinity of the outer surface of the input dynode;

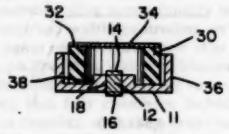
characterized in that the enabling means includes an apertured carrier sheet and an electrically-insulating spacing material, the spacing material having a second substantially uniform thickness, the spacing material and the apertured sheet being provided at the vicinity of the outer surface and being arranged such that the apertured sheet is insulated and spaced from the outer surface by the spacing material, the apertured sheet and the spacing material being further arranged such that the apertures in the carrier sheet are in register with the apertures in the input dynode, each aperture in the carrier sheet having a smallest diameter at least as large as the diameter of the respective opening at the outer surface of the input dynode, the second substantially uniform thickness of the spacing material being greater than the first substantially uniform thickness of the insulator separator which insulates the input dynode from the immediately adjacent dynode.

4,544,861

RECTIFIER HOUSING FOR USE WITH LIGHT BULBS

Roy Kretchmar, Boca Raton, Fla., assignor to Certified Energy Systems, Inc., Boca Raton, Fla.

Filed Apr. 11, 1983, Ser. No. 483,897
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—200 R **11 Claims**



1. A rectifier housing adapted to be releasably secured to the base of a screw base light bulb, said housing comprising:

a substantially rigid non-conductive base having an upper surface and a lower surface spaced therefrom and a substantially centrally positioned aperture, a rectifier element securely retained in said aperture, said rectifier element having an exposed face adjacent one of said base surfaces and an exposed face adjacent the other of said base surfaces and including an outer cylindrical sleeve of flexible material; and

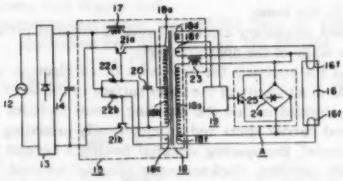
a resilient connector member secured to said upper surface and spaced radially outwardly from said rectifier element, said connector member having a thickness greater than the spacing between said upper surface and said lower surface of said base and having an adhesive-coated upper face spaced outwardly from said base for releasably securing said housing to a screw base light bulb.

4,544,862

LIGHTING CIRCUIT FOR ELECTRIC DISCHARGE LAMP

Hiroyoshi Yamazaki, Kamakura; Yoshiji Minagawa, Chigasaki; Michihiro Tsuchihashi, Kamakura; Yoshinori Anzai, Zushi, and Toshiro Kajiwara, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,560
Claims priority, application Japan, Mar. 14, 1983, 58-41806
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—209 R **19 Claims**



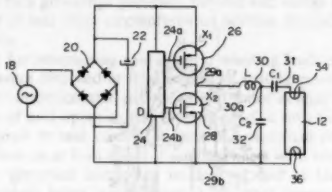
1. A lighting circuit for an electric discharge lamp, which comprises: an inverter which functions to convert a direct current power to a high frequency output power in a substantially sinusoidal waveform and operate a low pressure electric discharge lamp; a switching device provided at an output side of said inverter and supplying discharge current to said electric discharge lamp through its opening and closing operations; and a control device which controls said switching device so as to supply an output to said electric discharge lamp during a period including a peak value and its vicinity of an instantaneous value at each half cycle of the output from said inverter at the time of operating of said electric discharge lamp.

4,544,863

POWER SUPPLY APPARATUS FOR FLUORESCENT LAMP

Ken Hashimoto, 1-15-17, Komachi, Kamakura-shi, Kanagawa-ken, Japan

Filed Mar. 22, 1984, Ser. No. 592,173
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—209 R **3 Claims**



1. A power supply apparatus for a fluorescent lamp, comprising:

inverter means coupled to a source of AC line power, for converting said AC line power to a high-frequency drive voltage having a substantially square waveform, produced from first and second outputs thereof;

an inductor and a first capacitor connected in series between said inverter means and a first filament of said fluorescent lamp, for supplying said high-frequency drive voltage to said fluorescent lamp, with the capacitance of said first capacitor and the inductance of said inductor forming a series resonant circuit whose frequency of resonance is higher than but less than twice the value of the frequency of said high-frequency drive voltage, and;

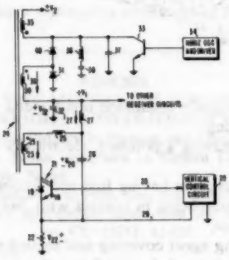
a second capacitor connected between an output terminal of said inductor and a second filament of said fluorescent lamp, with the capacitance value of said second capacitor being lower than that of said first capacitor.

4,544,864

SWITCHED VERTICAL DEFLECTION CIRCUIT WITH BIDIRECTIONAL POWER SUPPLY

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,174
Claims priority, application United Kingdom, Feb. 21, 1983, 8304755
Int. Cl.[4] H01J *29/72*
U.S. Cl. 315—393 **7 Claims**



1. A field deflection circuit for a video display apparatus, comprising:

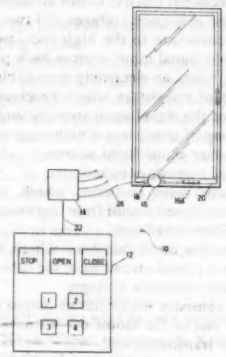
a source of voltage;

a field deflection winding coupled to said source of voltage;

energy storage means coupled to said field deflection winding

for providing field deflection current in said field deflection winding;
a source of line deflection rate energy incorporating a switching transistor;
means for applying a predetermined amount of said line deflection rate energy from said line deflection rate energy source to said energy storage means during a first portion of each line deflection interval and for removing a predetermined amount of energy from said energy storage means during a second portion of each line deflection interval; and
unidirectional current control means for completing a current path from said field deflection winding to a source of reference potential during a portion of a field deflection interval in response to switching of said transistor, said current path including said switching transistor.

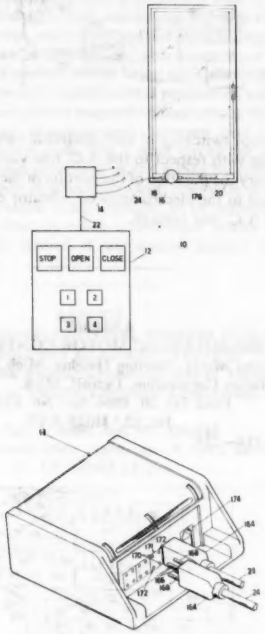
4,544,865
REMOTE WINDOW OPERATING SYSTEM
William G. Sharp, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jun. 8, 1984, Ser. No. 618,533
Int. Cl.⁴ H02P *3/08*
U.S. Cl. 318—53 **15 Claims**



1. A motor control circuit for a direct current permanent magnet motor comprising
wave shaping means to supply a periodic power waveform to the motor which regularly reaches zero voltage;
switching means for selectively energizing the motor with the output of the wave shaping means;
a voltage comparator also connected to the output of the wave shaping means for comparing the voltage at that output with a ground voltage;
programmable processing means for scanning the output of the comparator and for controlling the switching means to operate the switching means to disconnected the motor from the wave shaping means when a motor stall condition is detected by a lack of back electromagnetic force induced voltage at the output of the wave shaping means.

4,544,866
REMOTE WINDOW OPERATING SYSTEM
Richard R. Clemmons, Roscoe; Darrel E. Zimmer, and Stephen H. Sanders, III, both of Rockford, all of Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Jun. 28, 1984, Ser. No. 625,697
Int. Cl.⁴ H02P *3/08*
U.S. Cl. 318—54 **7 Claims**

1. A remote window operating system comprising
a direct current motor connected to operate the window, the motor opening and closing the window depending on the polarity of the voltage applied to the motor;
a diverse condition sensing device associated with the window to electrically sense a desired condition, the sensing device connected to the motor by two conductors;
a control circuit module for operating the motor by applying voltage of a selected polarity to the motor depending on user input and on the output of the sensing device;
a cable of four conductors connecting the motor to the control circuit module, two conductors each for the motor and the sensing device;
a four conductor connector receptacle on the control circuit module; and

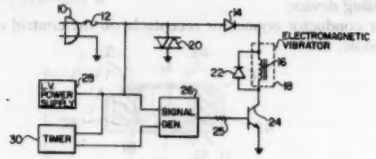


a four conductor connector attached to the cable to connect the cable to the control circuit module by connection to the connector receptacle, the conductors on the receptacle and the connector arranged to be reversibly symmetrical so that the connector can be inserted in the receptacle in either of two reversed configurations, each configuration corresponding one direction of rotation of the motor for a given polarity of voltage so that the polarity of voltage causing window opening and closing can be selected by selection of one of the configurations of the connector.

4,544,867
VIBRATOR FOR FURNITURE
John O. Jones, Jr., 1 Cross Creek, Irvine, Calif. 92714, and Charles White, Jr., 8901 Crescent Dr., Huntington Beach, Calif. 92646
Filed Apr. 4, 1983, Ser. No. 481,659
Int. Cl.⁴ H02K *33/00*
U.S. Cl. 318—129 **17 Claims**

1. In combination, an article of furniture; an electromagnetic vibrator, including a driving coil, for inducing vibrations into the article of furniture; and a control circuit for controlling the driving current supplied to the driving coil of said electromagnetic vibrator; said control circuit comprising:
plug means connected to said electromagnetic vibrator and adapted to be connected to source of A.C. line voltage; and
control means for controlling the duration of the portion of

each cycle of the A.C. line voltage supplied to said electromagnetic vibrator, said control means comprising an electronic switch connected in series with the driving coil of said electromagnetic vibrator and a control pulse generating means for supplying control pulses to said electronic switch



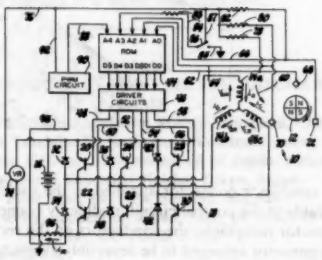
to control switching of said electronic switch in timed relationship with respect to the A.C. line voltage waveform so as to vary the duration of the portion of the A.C. line voltage supplied to the electromagnetic vibrator during each cycle of the A.C. line voltage.

4,544,868

BRUSHLESS DC MOTOR CONTROLLER

V. Balarama Murty, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1984, Ser. No. 633,053
Int. Cl.⁴ H02P *6/02*
U.S. Cl. 318—254 **3 Claims**



1. A drive circuit for a brushless DC motor having a permanent magnet rotor and a plurality of electrically energizable stator windings, comprising:

a source of direct voltage;

logic means responsive to the position of the motor rotor for indicating a stator winding energization pattern for producing motor rotation in a specified direction;

switching means for energizing said stator windings with said source according to the pattern indicated by said logic means, thereby to establish a winding current which increases at a rate determined according to the difference between the source voltage and the counter-EMF voltage induced in the winding due to motor rotation; and

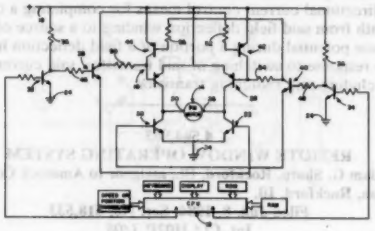
pulse-width-modulation means effective when the winding current exceeds a reference amount for interrupting the winding energization for a predetermined period of time, thereby to pulse-width-modulate the voltage applied to the motor windings at a frequency and off/on duty cycle which is relatively high near zero speed for producing smooth motor staring torque, and which automatically decreases with increasing motor speed in the specified direction.

4,544,869

ELECTRONIC CONTROL CIRCUIT FOR BI-DIRECTIONAL MOTION

James W. Pittaway, Anaheim, Calif., assignor to Unisen, Inc., Irvine, Calif.

Filed Oct. 5, 1983, Ser. No. 539,281
Int. Cl.⁴ H02P *1/22*
U.S. Cl. 318—293 **14 Claims**



1. In a bi-directional electric motor actuating system having (a) high and low reference voltages, (b) two motor terminals for selective connection to the high and low reference voltages, and (c) two signal input sources each providing high or low level logic pulses, an electronic control circuit comprising:

a first group of transistors which receives its input signal from one of the signal input sources; and

a second group of transistors which receives its input signal from the other signal input source;

each group of transistors including:

a first motor drive transistor which, when turned on, provides a closed circuit from one motor terminal to the high reference voltage;

a second motor drive transistor which, when turned on, provides a closed circuit from the other motor terminal to the low reference voltage;

a lockout transistor which has its output connected to the input of one of the motor drive transistors in the other group of transistors; and

a control transistor receiving an input signal controlled by one of the two signal input sources;

the output of the control transistor producing the input signal to both the first and second motor drive transistors, whereby actuation of the control transistor simultaneously turns on both of said motor drive transistors; and

the output of the control transistor having a parallel connection to the input of the lockout transistor, whereby actuation of the control transistor causes the output signal of the lockout transistor to turn off the motor drive transistor with the result that the turning on of the first and second motor drive transistors and the prevention of turning on of one of the motor drive transistors in the other group are automatically coordinated by a single control transistor.

4,544,870

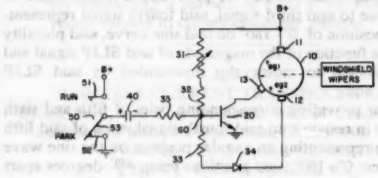
INTERMITTANT WINDSHIELD WIPER CONTROL SYSTEM WITH IMPROVED MOTOR SPEED CONTROL

Robert W. Kearns, 9725 Lookout Pl., Gaithersburg, Md. 20760, and Timothy B. Kearns, Gaithersburg, Md., assignors to Robert W. Kearns, Gaithersburg, Md.

Continuation-in-part of Ser. No. 29,338, Apr. 12, 1979, Pat. No. 4,339,698. This application Sep. 7, 1982, Ser. No. 604,640
Claims priority, application PCT Int'l Appl., Jul. 12, 1982, PCT/US82/00924
Int. Cl.⁴ H02P *1/04*
U.S. Cl. 318—444 **23 Claims**

1. In an intermittent windshield wiper system comprising a motor connected to drive a windshield wiper through repeat-

ing wiping cycles over a windshield, each wiping cycle including an upstroke at the start of the wiping cycle and down stroke at the end of the wiping cycle, an amplifying device, switch means driven by said motor having a RUN position and a DWELL position and moving to said DWELL position at the end of each wiping cycle, and circuit means responsive to said switch means to cause said amplifying device to energize said motor intermittently to cause said wiper to stop for dwell periods at the ends of successive wiping cycles; the improvement wherein said circuit means includes speed regulating means responsive to the speed of said motor to apply a signal to the input of said amplifying device to cause said amplifying device to energize said motor with continuous current con-



trolled to regulate the speed of said motor during the downstrokes of said wiping cycles.

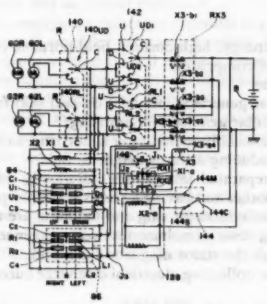
15. A motor speed control system comprising a threebrush motor having first, second and third brushes, an amplifying device having output electrodes connected to said third brush in a circuit to control the energization of said motor between said first brush and said third brush and having an input electrode, said amplifying device controlling the current flow from its output electrodes in accordance with the signal applied to said input electrode, means to apply a signal derived from said second brush to said input electrode to regulate the speed of said motor and means to apply a signal derived from said third brush to said input signal to regulate the speed of said motor.

4,544,871

MEMORY RESET ARRANGEMENT FOR MIRROR

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Jun. 28, 1983, Ser. No. 509,164
Claims priority, application Japan, Jun. 28, 1982, 57-112136
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568 **9 Claims**



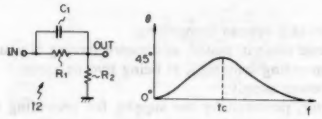
1. In a remote control type angle adjusting arrangement for a mirror including a mechanism casing which is fixedly provided in a mirror housing and to which generally a central portion of a rear face of a back cover member for supporting the mirror is pivotally connected, and first and second push-pull driving shafts coupled to reversible motor means through power transmitting means and extending from said mechanism casing for axial movement so as to pivot said back cover member and mirror in predetermined directions about said pivotal connection, one end of said first push-pull driving shaft being connected selectively to an upper or lower side and one end of said second push-pull driving shaft being connected selectively to a left or right side of said back cover member with respect to said central pivotal connection, a memory reset arrangement for the mirror, which comprises memory switches each including a switch shaft connected to the other end of each of said first and second push-pull driving shafts so as to be movable in an axial direction, a contact holder fitted over the switch shaft in an axial direction for selective engagement with or disengagement from said switch shaft, and having movable contacts accommodated therein, and a fixed contact plate having a fixed contact formed face to which said movable contacts are held in sliding contact, said contact holder being normally urged by a spring means to a predetermined neutral position on said fixed contact plate, and an electro-magnetic clutch means for selective engagement or disengagement between said contact holder and said switch shaft, and a reset circuit for feeding electric power to said reversible motor means by effecting a self-retaining function in association with operation of a reset switch, said reset circuit being arranged to be released from said self-retaining function when said contact holder of said memory switch has arrived at said neutral position on said fixed contact plate.

4,544,872

TRACKING SERVO CONTROL SYSTEM FOR AN INFORMATION READ-OUT SYSTEM

Hiroyuki Hirano, and Kelichi Matsumoto, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,845
Claims priority, application Japan, Apr. 5, 1983, 58-59824
Int. Cl.[4] G05D *23/275*
U.S. Cl. 318—632 **2 Claims**



1. A tracking servo control system for an information read-out system in which a recorded information is read-out from a recording medium having a plurality of recording tracks and an information read-out point can be displaced with respect to position of the recording track by means of a tracking actuator, comprises:

a tracking error signal generating means for generating a tracking error signal representing a magnitude and a direction of a tracking error;

a phase compensation means responsive to said tracking error signal, for controlling a phase characteristics of said tracking error signal;

a drive means for driving the tracking actuator in accordance with said tracking error signal from said phase compensation means;

a servo loop switch means disposed between said phase compensation means and drive means for enabling and disabling the transmission of the tracking error signal to the drive means in accordance with a timing control signal;

an on-track signal generating means, for generating an on-track signal when the information read-out point is located on one of recording tracks;

a zero cross detection means responsive to said tracking error signal, for generating a zero cross detection signal indicative of zero cross timings of said tracking error signal;

a timing control means for generating said timing control

signal for opening and closing said servo loop switch means, in accordance with said on-track signal and said zero cross detection signal; and

a phase shift means disposed between said tracking error signal generating means and said zero-cross detection means, having a phase shift function substantially the same as that of said phase compensation means for a predetermined frequency range of said tracking error signal, whereby correcting a timing of on/off operation of the servo loop switch means and assuring a quick and stable lock-in of the tracking servo loop.

4,544,873

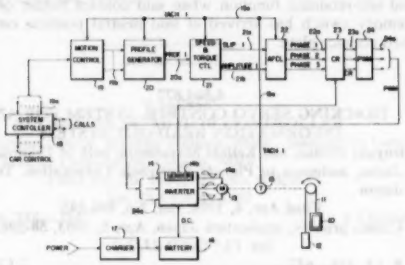
ELEVATOR POLYPHASE MOTOR CONTROL

Jalal T. Salihi, Manchester, Conn., and James J. Duckworth, Rockaway, N.J., assignors to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 373,063, Apr. 29, 1982, abandoned. This application May 21, 1984, Ser. No. 611,933

Int. Cl.⁴ H02P *5/34*

U.S. Cl. 318—801 **5 Claims**



1. An elevator system comprising:

a polyphase electric motor, said motor having N phases and corresponding windings, N being two or more;

a D.C. power supply;

an inverter, powered by the supply, for providing current or voltage to each stator winding in the motor, said inverter having an input for each winding and a corresponding output;

a position encoder for providing a signal (TACH) that identifies the motor shaft position;

an elevator car that is propelled by the motor;

an elevator control system for controlling the operation of the inverter to produce alternating N phase current or voltage for said stator windings to control motor speed (r.p.m.), slip and direction;

the elevator system being characterized in that said control system comprises:

means for providing a signal (AMPLITUDE) in response to the TACH signal to control motor speed (r.p.m.);

means for providing a signal (SLIP) in response to the TACH signal to control the difference between the motor r.p.m. and the frequency (F SYNCH) of the alternating current or voltage that is supplied to the motor by the inverter;

means, responsive to the SLIP signal and TACH signal, for providing a signal that repeats at F SYNCH, said signal identifying an angular position on a sine curve, and for providing, from said signal that repeats at F SYNCH, N second signals, each representing the Y-coordinate on said sine curve at different angular positions thereon, said positions being equally spaced apart by $\frac{360°}{N}$, and said N second signals being provided in a successive sequence during each motor rotation, the sequence in one motor direction being the reverse of the sequence in the opposite direction;

means for providing an inverter drive signal from each second signal as it is produced, and varying the magnitude of the inverter drive signal as a function of the AMPLITUDE signal;

means for applying each inverter drive signal to the correct one of the inverter inputs according to said successive sequence in response to one of N control signals;

means for generating N signals in a repeated succession during each motor rotation, each identifying an inverter input, to provide the N control signals;

means for providing a third signal in response to said TACH signal and said SLIP signal, said third signal representing a motor shaft position within one of four possible quadrants on a sine curve with a frequency of F SYNCH and being repeated a plurality of times during each shaft rotation, and for providing a fourth signal in response to said third signal, said fourth signal representing a position of 0°–180° on said sine curve, said plurality being a function of the magnitude of said SLIP signal and proportional to motor slip represented by said SLIP signal; and

means for providing corresponding pairs of fifth and sixth signals in response to said fourth signal, each of said fifth signals representing an angular position on the sine wave between 0°–180°, said positions being $\frac{180°}{N}$ degrees apart for each fourth signal, each of said sixth signals representing the correct sign, either plus or minus, for its corresponding fifth signal; and

means for providing a corresponding seventh signal in response to each fifth signal, said seventh signal being the sine X, where X identifies an angular position between 0°–180° that is identified by the fifth signal.

4,544,874

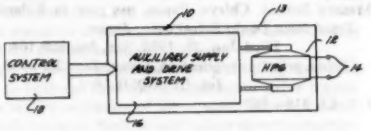
HOMOPOLAR GENERATOR POWER SUPPLY SYSTEM

William F. Weldon, and John H. Gully, both of Austin, Tex., assignors to The Board of Regents, The University of Texas, Austin, Tex.

Filed May 26, 1982, Ser. No. 381,927

Int. Cl.⁴ H02K *31/00*; H02P *9/00*

U.S. Cl. 322—10 **10 Claims**



1. A high-energy, high-current, field-portable pulsed power supply system comprising:

a skid frame;

a homopolar generator mounted on said skid frame;

said homopolar generator comprising:

a stator assembly including a stator ring and a field coil, for producing a stator magnetic field;

a rotor separated into halves electrically insulated from one another and having a recess in the periphery thereof wherein said stator ring and field coil are disposed, for making two simultaneous voltage-generating passes through the stator magnetic field; and

means for collecting electrical discharge current from said rotor;

an auxiliary supply and drive system on said skid frame including a prime mover for providing operating power, and means for motoring the homopolar generator to speed; and

a control system coupled to said homopolar generator and said auxiliary supply and drive system, for controlling the operation of said homopolar generator to obtain pulsed electrical power therefrom.

10. A high-energy, high-current homopolar generator, comprising

a support structure;

a stator housed within said support structure for coupling a magnetic field therethrough;

a field coil disposed adjacent and radially inward of the stator, for producing a stator magnetic field;

a rotor carried in said support structure,

said rotor having a recess in the periphery thereof for receiving therein stator and said field coil, and being split into halves insulated from one another for making two simultaneous voltage-generating passes through the stator magnetic;

an inner brush mechanism disposed radially inward of the field coil, for contacting a surface of each rotor half inside the recess of said rotor to collect discharge current; and

an outer brush mechanism carried by said support housing, for contacting a surface of each rotor half outside the recess therein to collect discharge current.

4,544,875

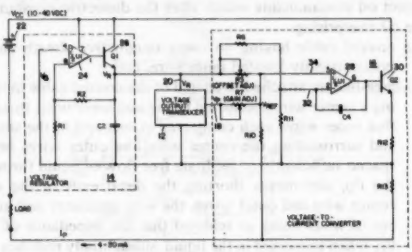
VARIABLE CURRENT TRANSDUCER SYSTEM

Kyong Park, and Tom O. Kavli, both of Chatsworth, Calif., assignors to Kavlico Corporation, Chatsworth, Calif.

Filed May 29, 1984, Ser. No. 615,291

Int. Cl.⁴ G05F *1/46*; G01L *9/12*

U.S. Cl. 323—280 **18 Claims**



1. A system for converting a capacitive pressure transducer having a variable output voltage to a current output unit comprising:

a pressure transducer having a variable voltage output in response to variable input pressure applied to the transducer;

voltage regulator means for supplying operating power to said pressure transducer;

a voltage-to-current converter including an operational amplifier and an output transistor;

means for applying a reference potential to one input of said operational amplifier substantially equal to the zero pressure output voltage of said pressure transducer;

means for coupling the output of said transducer to the other input of said operational amplifier;

said coupling means including first potentiometer means connected between the output of said pressure transducer and the second input of said operational amplifier to control the gain of the system; and

second potentiometer means connecting the output from said voltage regulator to the junction of said first potentiometer means and said second input to said operational amplifier, to control the offset adjustment of said system.

4,544,876

VOLTAGE REGULATOR

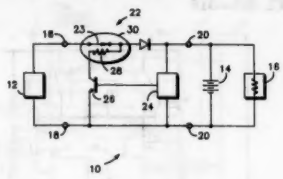
William L. Bailey, Phoenix, and William J. Kaszeta, Mesa, both of Ariz., assignors to Solavolt International, Houston, Tex.

Filed Dec. 16, 1983, Ser. No. 562,367

Int. Cl.⁴ G05F *1/46*

U.S. Cl. 323—282 **6 Claims**

1. A voltage regulator comprising: an input for coupling to an energy source and an output for coupling to a load; a thermally activated switch having a first end coupled to said input and a second end coupled to said output; a control circuit for sensing voltage level supplied to said load and for generating a control signal responsive to the voltage level sensed; a resistor positioned proximate said switch and coupled to said second end for heating said thermally activated switch in response to said control signal and causing said switch to open; a transistor



in series with said resistor for driving current through said resistor, said resistor and transistor coupled in parallel across said output, and said transistor coupled to said control circuit for receiving said control signal; and insulating means disposed about said switch to keep said switch open for a predetermined time after said control signal is removed.

4,544,877

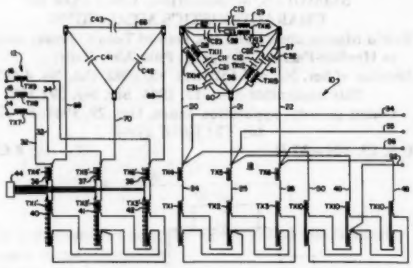
POWER CONDITIONING SYSTEM AND APPARATUS

Jeffrey M. Powell, Galena, Ohio, assignor to Liebert Corporation, Columbus, Ohio

Filed Jul. 5, 1983, Ser. No. 510,560

Int. Cl.⁴ G05F *3/06*

U.S. Cl. 323—308 **32 Claims**



1. Apparatus for use with an a.c. source of variable voltage level and waveshape, and having a given frequency, for providing a regulated a.c. output to a load, comprising:

input choke means having a non-linear impedance characteristic connectable with said a.c. source for deriving an energy input substantially immune from said variable waveshape and voltage level;

primary winding means coupled with said input choke means for effecting energy transfer; and

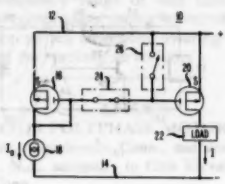
regulator means including saturable reactor means having secondary winding means inductively coupled in energy transfer relationship with said primary winding means, first capacitor means of first predetermined capacitance value coupled with said secondary winding means, and second capacitor means of second predetermined capacitance value coupled with said primary winding means, said first and second capacitor means effecting the oscillatory saturation of said reactor means at said given frequency and said first and second capacitance values being selected in accordance with a ratio minimizing the energy appearing across said saturable reactor means in the course of the oscillatory saturation thereof.

4,544,878

SWITCHED CURRENT MIRROR

Richard G. Beale, Freehold, N.J., and Apparajan Ganesan, Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 4, 1983, Ser. No. 538,946
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—315 8 Claims



1. An electronic circuit, comprising:

an input transistor having a conduction path and a control electrode therefor, one side of its conduction path being connected to its control electrode and the other side of its conduction path being connected to a supply voltage node;

an output transistor having a conduction path and a control electrode therefor, one side of its conduction paths being connected to the supply voltage node;

first means adapted to selectively connect and disconnect the output transistor control electrode from a shut-off voltage source, and

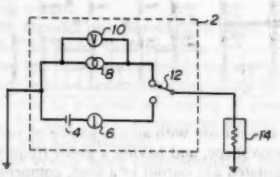
second means adapted to selectively connect and disconnect the output transistor control electrode from the input transistor control electrode.

4,544,879

STIMULUS/MEASURING UNIT FOR DC CHARACTERISTICS MEASURING

Koichi Maeda, and Haruo Ito, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 434,657, Oct. 15, 1982, Pat. No. 4,467,275.
This application Mar. 19, 1984, Ser. No. 591,347
Claims priority, application Japan, Oct. 29, 1981, 56-173654
Int. Cl.[4] G01R 27/00
U.S. Cl. 324—57 R 4 Claims



1. A stimulus/measuring unit for measuring the electrical characteristics of an electrical element, said stimulus/measuring unit comprising:

a voltage source;

a current measuring device connected in series with the voltage source;

a current source;

a voltage measuring device connected in parallel with the current source; and

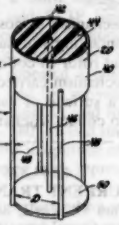
switch means coupled directly to both the series combination of the voltage source and the current measuring device, and the parallel combination of the current source and the voltage measuring device for selecting which of the series combination of the voltage source and current measuring device or the parallel combination of the current source and the voltage measuring device is coupled to the electrical element to be measured, so that said stimulus/measuring unit can both electrically stimulate the electrical element and measure the electrical response of the electrical element.

4,544,880

MICROWAVE PROBE FOR MEASUREMENT OF DIELECTRIC CONSTANTS

Louis L. Nagy, Warren, and Michael J. O'Rourke, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 372,470, Apr. 28, 1982, Pat. No. 4,503,384.
This application Nov. 15, 1984, Ser. No. 671,594
Int. Cl.[4] G01R 27/04
U.S. Cl. 324—58.5 R 3 Claims



1. A microwave probe adapted for insertion into the crankcase of an internal combustion engine through a dipstick passage for measuring the dielectric constant of engine oil to detect oil contaminants which alter the dielectric constant of the oil comprising:

a coaxial cable having an outer conductive sheath and a concentrically located inner wire, and

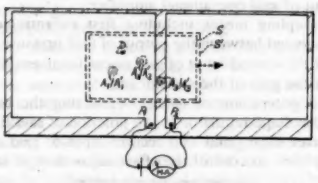
a cage-like tip attached to an end of the coaxial cable including a center wire connected to the said inner wire, three to five outer wires each connected at one end to the sheath and surrounding the center wire, the outer wires being spaced sufficiently to facilitate free flow of liquid through the tip, and means shorting the distal ends of the said center wire and outer wires, the wire geometry and number of wires being so selected that the impedance of the tip, when immersed in the liquid, substantially matches the impedance of the coaxial cable and sufficiently contains microwave energy within the tip to prevent substantial radiation outside of the probe, the cable and tip being smaller in diameter than the said passage.

4,544,881

DEVICE FOR TESTING THE INSULATION OF PRINTED CIRCUITS

Jacques Saroul, Valence, France, assignor to Crouzet, Paris, France

Filed Feb. 1, 1983, Ser. No. 462,779
Claims priority, application France, Feb. 10, 1982, 82 02287
Int. Cl.[4] G01R 31/28
U.S. Cl. 324—73 PC 20 Claims



1. A device for the quality control testing of the galvanic insulation between conducting elements of a printed circuit provided with conducting studs, comprising:

specific sensor means, having an insulating screen provided with individual conducting studs, to be positioned opposed to said printed circuit, wherein each conducting stud of said sensor means registers and is electrically in contact with a single predetermined conducting stud of conducting element of said printed circuit;

scanning means having fixed and separate conducting zones, to be positioned opposed to said individual conducting

studs of said specific sensor means and in electrical contact therewith and to be slidably moved thereover, whereby one of said conducting zones, through one of said conducting studs of said sensor means and one of said conducting studs of said printed circuit, may be in electrical contact with another of said conducting zones, through another of said conducting studs of said sensor means and another of said conducting studs of said printed circuit; and

indicator means electrically connected between said conducting zones,

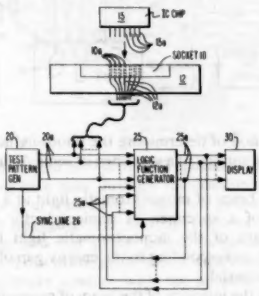
for detecting an undesirable insulation defect between two of said conducting elements.

4,544,882

APPARATUS FOR TESTING AN INTEGRATED CIRCUIT CHIP WITHOUT CONCERN AS TO WHICH OF THE CHIP'S TERMINALS ARE INPUTS OR OUTPUTS

Laurence P. Flora, Covina, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 7, 1982, Ser. No. 447,732
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 324—73 R **11 Claims**



1. In apparatus for testing an electrical circuit having input and output terminals with significantly different input and output impedances, the combination comprising:

test signal means for applying logical signals to the input and output terminals of said circuit;

said test signal means having a driving impedance chosen in conjunction with said input and output impedances such that said driving impedance is low enough to cause an input terminal to receive an acceptable input logical signal having the same logical value as provided by said test signal means, while being high enough to cause an output terminal to provide an output logical signal having the same logical value as would normally be provided thereby in response to the input logical signals applied to the input terminals of the circuit by said test signal means.

4,544,883

METHOD AND DEVICE FOR RAPIDLY MEASURING FREQUENCY RESPONSE OF ELECTRONIC TEST OBJECTS

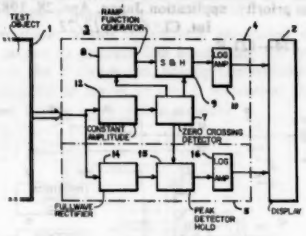
Michael Grimsland, Lagavagen 31, S-121 59 Johanneshov, Sweden

Filed Sep. 20, 1983, Ser. No. 533,919
Claims priority, application Sweden, Sep. 21, 1982, 8205399
Int. Cl.⁴ G01R *27/00, 27/02, 23/16*
U.S. Cl. 324—77 CS **9 Claims**

1. A method for determining the frequency response of an electronic test object comprising:

supplying an input test signal to said electronic test object, said signal including a sine pulse train of partial signals of different, predetermined frequencies, said partial signals being not substantially more than a full period in duration;

detecting the frequency response of said test object to said input test signal by measuring independent of said input test signal said test object output signal, and providing a first signal representing the instantaneous frequency of a signal from said test object, and a second signal representing the amplitude of the signal from said test object; and



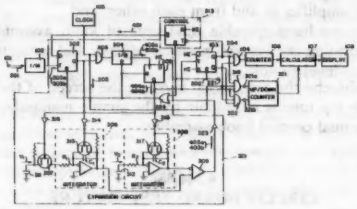
supplying said first and second signals to a display means whereby an instantaneous indication of the level and frequency of a signal produced by said test object is obtained without synchronizing said display means with said input test signal.

4,544,884

PERIOD AND FREQUENCY MEASURING INSTRUMENT

Mishio Hayashi, Saitama, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,711
Claims priority, application Japan, Sep. 13, 1982, 57-159187
Int. Cl.⁴ G01R *23/02*
U.S. Cl. 324—78 R **6 Claims**



1. An instrument for determining the period and frequency of an input signal, comprising

clock means for providing first and second clock signals,

first divider means for dividing said input signal by a predetermined division factor to output a divided signal having a minimum period, wherein a first fractional time is defined between a first output of said first divider means and the first clock pulse of said first clock signal thereafter, and a second fractional time is defined between the following output of said first divider means and the first clock pulse of said first clock means thereafter,

gate signal generating means for generating a gate signal synchronized with said first clock signal,

counter means for counting the clock pulses of said first clock signal during said gate signal,

expansion means for expanding each said fractional time, at least the expanded first fractional time being shorter than the minimum period of said divided signal,

up-down counter means for providing a count of the clock pulses of said second clock signal corresponding to the difference between the first and second expanded fractional times, and

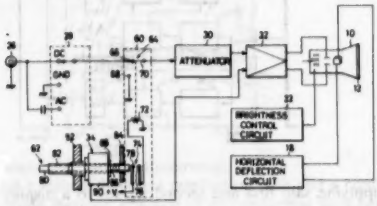
calculator means for calculating the period and frequency of said input signal by adding the count from said counter means to a value corresponding to the count from the up-down counter means.

4,544,885

CATHODE RAY OSCILLOSCOPE WITH A DUAL CONTROL KNOB ASSEMBLY FOR EASY ZERO LEVEL ADJUSTMENT

Toru Takahashi, Wako, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,430
Claims priority, application Japan, Apr. 28, 1982, 57-73184
Int. Cl.⁴ G01R *13/22*
U.S. Cl. 324—121 R **7 Claims**



1. A cathode ray oscilloscope of the kind having input means for the reception of a signal to be observed or measured, a vertical amplifier for amplifying the input signal, a cathode ray tube for displaying on a screen the amplified replica of the input signal, the cathode ray tube exhibiting on the screen a bright horizontal line representative of a zero signal level upon disconnection of the vertical amplifier from the input means, and a vertical position adjuster coupled to the vertical amplifier and operable manually for adjustably varying the vertical position of the display on the screen of the cathode ray tube, wherein the improvement comprises:

(a) a zero level switch connected between the input means and the vertical amplifier and actuable manually for connecting and disconnecting the input means and the vertical amplifier to and from each other; and

(b) a one-hand-operable dual control knob assembly for operating the vertical position adjuster and actuating the zero level switch;

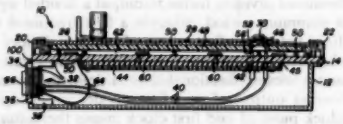
(c) whereby the zero signal level on the screen of the cathode ray tube is adjustable by the simple manipulation of the dual control knob assembly.

4,544,886

CIRCUIT BOARD TEST FIXTURE

John D. Murray, Milpitas, and Sydney J. Weiss, Scotts Valley, both of Calif., assignors to M-Rel, Inc., Milpitas, Calif.

Filed Sep. 30, 1982, Ser. No. 428,701
Int. Cl.⁴ G01R *31/02*
U.S. Cl. 324—158 F **10 Claims**



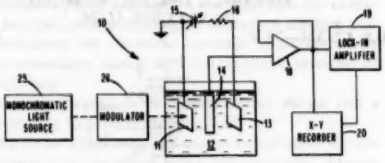
1. In a circuit board test fixture having a base, a plate resiliently mounted in spaced relationship above the base for movement perpendicular to the base, a diaphragm supported upon the plate for carrying a circuit board to be tested, said plate and said diaphragm having at least one internal cut-out portion, electrical probes supported by the base extending into the cut-out portions of the plate and diaphragm, means for creating differential pressure acting upon the diaphragm to move the diaphragm and plate towards the base bringing the circuit board to be tested into engagement with the electrical probes, said plate and said diaphragm having marginal edges with the diaphragm marginal edges being spaced outward laterally beyond the plate marginal edges, and the improvement comprising a mount having slots therein for loosely receiving the marginal edges of the diaphragm that can be withdrawn from the slots by pinching the diaphragm to move the marginal edges towards the center of the diaphragm, sealing surfaces curving downwardly from the slots for the diaphragm to form a direct seal against when drawn tightly thereabout, and inner most faces that are spaced outwardly from the marginal edges of the plate, whereby said diaphragm and said plate can be readily removed upwardly from the base to provide access for cleaning the electrical probes while the mount remains fixed to the base.

4,544,887

METHOD OF MEASURING PHOTO-INDUCED VOLTAGE AT THE SURFACE OF SEMICONDUCTOR MATERIALS

Emil Kamieniecki, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 21, 1982, Ser. No. 435,847
Int. Cl.⁴ G01R *31/26*
U.S. Cl. 324—158 R **4 Claims**



1. The method of determining the photo-induced voltage at a region of the surface of a specimen of semiconductor material comprising

directing a beam of monochromatic light at a region of the surface of a specimen of semiconductor material, the wavelength of the monochromatic light being shorter than that corresponding to the energy gap of the semiconductor material;

modulating the intensity of the beam of monochromatic light at a frequency (f) so that the intensity (Φ) of the light impinging on said region of the surface of the specimen varies from a maximum to a minimum; and

measuring the resulting AC voltage signal (δV_s) induced at the region of the surface of the specimen by the modulated light;

the intensity of the beam of light (Φ) and the frequency of modulation (f) being selected such that the AC voltage signal (δV_s) is directly proportional to the intensity of light (Φ) and reciprocally proportional to the frequency of modulation (f); ($\delta V_s \propto \Phi/f$).

4,544,888

MINIATURE CIRCUIT PROCESSING DEVICES AND MATRIX TEST HEADS FOR USE THEREIN

Joseph Kvaternik, 19366 McCourtney Rd., Grass Valley, Calif. 95945

Continuation-in-part of Ser. No. 317,413, Nov. 2, 1981, Pat. No. 4,510,445. This application Nov. 1, 1982, Ser. No. 437,951
Int. Cl.⁴ G01R *1/06, 31/02*
U.S. Cl. 324—158 P **12 Claims**

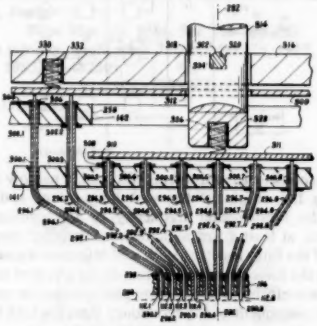
1. In a miniature circuit processing apparatus including a base plate, a chuck for holding a device including a plurality of miniature electronic circuits to be tested and for moving said device relative to said base, a test head carried by said base plate and having probe means for engaging predetermined parts of one of said miniature circuits, and optical means for viewing said miniature circuits and aiding in the positioning of said chuck and the carried miniature circuits relative to said test head, an improved test head comprising:

a plurality of elongated conductive test probe means each of which has a first top portion and a second tip portion, the latter being adapted to make electrical contact with a

predetermined determined area of a miniature circuit to be tested;

a plurality of elongated test probe guide means adapted to slideably receive and frictionally engage an associated one of said test probe means and including conductive means for providing electrical connection therewith;

support means for positioning said test probe guide means so that they extend in a generally vertical orientation with the upper end portions thereof relatively widely spaced apart and the lower end portions thereof relatively closely spaced apart and in predetermined collocation relative to the miniature circuit to be tested, said support means including a plurality of planar insulative board means horizontally disposed in spaced apart, stacked, parallel



relationship and provided with spaced apart apertures for receiving in a pass through relationship the said upper portions of at least some of said test probe guide means;

means for engaging said first tip portions and resiliently thrusting said test probe means longitudinally of their associated test probe guide means such that said second tip portions make contact with the miniature circuit to be tested; and

circuit means disposed on said board means for connecting said conductive means to a processing device.

2. An improved test head as recited in claim 1 in which said circuit means include a plurality of conductors each of which is electrically connected to the conductive means of one of said test probe guide means.

4,544,889

ROBOT PRECISION PROBE POSITIONER WITH GUIDANCE OPTICS

Ferdinand Hendriks, San Jose, Calif., and Russell H. Taylor, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1983, Ser. No. 530,927
Int. Cl.[4] G01R *1/067*; G05B *1/06*
U.S. Cl. 324—158 P **6 Claims**

1. A precision probe system for probing a target optically distinguishable from a background, the probe system having coarse X-Y-Z positioning mechanism, effector mechanism and control mechanism

characterized by

(a) effector carriage means coarsely positionable by the coarse X-Y-Z positioning mechanism in the general vicinity of a microtarget;

(b) microprobe means having a probe carrier and probe arranged with limited X-Y-Z freedom in said effector carriage means, said probe having a probe tip and a probe mounting end opposite said probe tip along an axis;

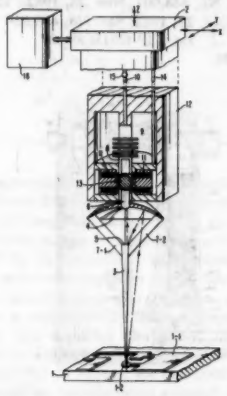
(c) optical sensing means, mounted in fixed relationship to said microprobe means, for providing a recognition signal at the control mechanism when said microprobe means is aligned with a microtarget;

(d) optical focusing means, substantially coaxial with said microprobe means, operative to transmit light with minimal loss from probe tip to probe mounting end of said probe;

(e) X transducer means operatively associated with said probe carrier to provide fine positioning for said probe carrier in the X dimension;

(f) Y transducer means operatively associated with said probe carrier to provide fine positioning for said probe carrier in the Y dimension;

(g) Z transducer means operatively associated with said probe carrier to provide fine positioning for said probe carrier in the Z dimension, having controllable position until impeded in travel in the Z dimension and, when impeded, having controllable pressure;



(h) microprobe mounting means attaching said probe at its probe mounting end to said microprobe carrier means;

(i) X-Y control connection means, responsive to the control mechanism, for providing control signals to said X fine positioning means and to said Y fine positioning means, to position said probe within the microtarget airspace;

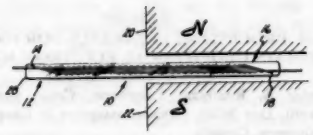
(j) Z control connection means, responsive to the control mechanism, for providing control signals to said Z fine positioning means, to transport said probe tip to contact the surface of the selected microtarget and apply probe contact pressure within a specified range, and selectively to withdraw said probe from contact with the selected microtarget.

4,544,890

FLAT COIL VELOCITY TRANSDUCER

Glenn D. Albert, Yukon, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Nov. 7, 1983, Ser. No. 549,039
Int. Cl.[4] G01P *3/46, 3/52*
U.S. Cl. 324—163 **4 Claims**



1. A velocity transducer for measuring the velocity of a moveable member, said transducer comprising

(a) a substantially thin, flat coil attached to said member having a plurality of convolutions skewed in the plane of movement of the member so that a first region at one end of the coil comprises a plurality of predominantly upper legs of convolutions and a second region at the other end of the coil comprises a plurality of predominantly lower legs of convolutions, and

(b) means for producing a magnetic field in a direction transverse to said legs in a locality including one of said regions and excluding the other of said regions, the coil being so disposed and arranged with the magnetic field that a voltage is induced in the coil whenever the member is moved causing movement of the coil in a direction transverse to the magnetic field and the legs of the coil.

4,544,891

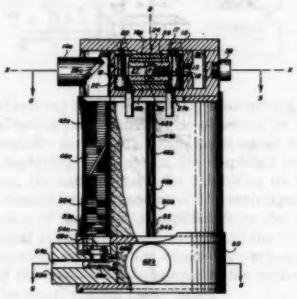
NUCLEAR MAGNETIC RESONANCE GYROSCOPE

Francis A. Karwacki, Harleysville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 444,001, Nov. 23, 1982,. This application Dec. 27, 1982, Ser. No. 453,014

Int. Cl.[4] G01R *33/08*

U.S. Cl. 324—304 **13 Claims**



1. A nuclear magnetic resonance gyroscope which derives rotational information from the phases of precessing nuclear moments for determining the angle of rotation of the gyroscope about a predetermined axis comprising:

a resonance cell containing samples of isotopes of an element for producing nuclear magnetic resonance signals is mounted on the predetermined axis;

plate means connected for producing a uniform unidirectional magnetic field oriented along the predetermined axis and intersecting said resonance cell for causing free precession of the net magnetic moment therein;

first optical means for periodically increasing the magnitude of the net magnetic moment of said resonance cell transverse to said magnetic field;

second optical means transverse to said magnetic field and orthogonal to said first optical means for detecting the phase of the magnetic moment of said resonance cell;

output means for processing said detected phases to produce an output signal indicative of the rotation of said gyroscope about said predetermined axis, a feedback signal for controlling said first optical means and a second feedback signal for controlling said magnetic field.

4,544,892

SIGNAL PROCESSING APPARATUS FOR FREQUENCY DOMAIN GEOPHYSICAL ELECTROMAGNETIC SURVEYING SYSTEM

Alexander A. Kaufman, Lakewood, Colo., and James D. McNeill, Don Mills, Canada, assignors to Geonics Limited, Mississauga, Canada

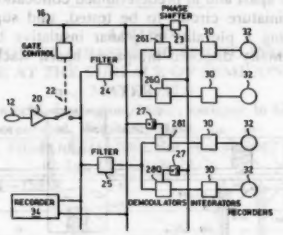
Filed Aug. 17, 1982, Ser. No. 408,748

Claims priority, application Canada, Feb. 18, 1982, 396553

Int. Cl.[4] G01V *3/10*

U.S. Cl. 324—334 **6 Claims**

1. Apparatus for processing signals in the frequency domain from a geophysical electromagnetic survey of the type in which terrain to be surveyed is subjected to a primary magnetic field by a transmitter energized by a cyclical current waveform such that the field is subject to abruptly commencing interruptions at regular intervals, and a receiver coil is responsive to secondary fields induced in the terrain, during the interruptions, the apparatus comprising a receiver producing secondary signals representative of the magnitude of the currents induced in the coil by the secondary fields, switching means configured to pass only such secondary signals, corresponding to currents induced in the receiver coil, as occur during regular predetermined intervals within the interruptions, a source of a reference signal in synchronism with said cyclical current waveform, means to control said switching



means responsive to said reference signal, a narrow band filter receiving the output of the switching means and tuned to accept the fundamental frequency of the cyclical current waveform, at least a first synchronous detector receiving the output of the filter together with said reference signal whereby to detect the filter output in relation to the phase of the primary current waveform on a detection axis selected to recover the in-phase component of the secondary signal at said fundamental frequency.

4,544,893

BATTERY VOLTAGE DETECTOR

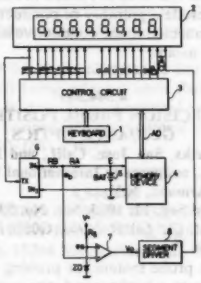
Hiroshi Takahashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,595

Claims priority, application Japan, Aug. 28, 1981, 56-135073

Int. Cl.[4] G01N *27/46*

U.S. Cl. 324—433 **17 Claims**



1. A battery voltage detector powered by a source battery, comprising:

(a) display means having a plurality of segments;

(b) time-division signal output means for putting out time-division signals for driving said plurality of segments in said display means in a time-division mode;

(c) voltage detecting means for detecting the voltage of the source battery in response to said time-division signals output from said time-division signal output means;

(d) means for producing a reference voltage;

(e) voltage comparison means for comparing the battery voltage as detected by said voltage detecting means with said reference voltage; and

(f) segment driving means for driving at least one segment

preselected from said plurality of segments based on the result of said comparison by said voltage comparison means.

4,544,894

DC VOLTAGE CONTROL CIRCUITS

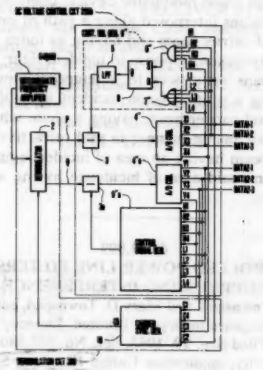
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 591,752

Claims priority, application Japan, Mar. 23, 1983, 58-48249; Mar. 23, 1983, 58-48250

Int. Cl.⁴ H03D *3/00*

U.S. Cl. 329—122 **10 Claims**



10. A demodulation apparatus comprising in combination a demodulation circuit for demodulating a modulated carrier wave and a DC voltage control circuit for compensating for DC component variations caused when discriminating and regenerating the demodulated signal:

said DC voltage control circuit including a plurality of DC superposing means each superposing a control signal upon an input demodulated signal;

a plurality of discriminating means each connected to the respective DC superposing means, for discriminating an output of said superposing means with a plurality of signal discriminating levels including a center discriminating level and with a plurality of error discriminating levels and for providing a plurality of digital signals, said signal discriminating levels dividing said input signal into a plurality of signal regions, said error discriminating levels dividing said signal regions into two, respectively; and

a plurality of control signal generator means for generating said control signal in response to some of said digital signals, which comprise error information obtained from said error regions except at least the error regions on positive or negative side adjoining said center discriminating level;

said demodulation circuit including a carrier synchronizing circuit responsive to the outputs of said DC voltage control circuit for providing a reference carrier wave, and a demodulator for detecting the modulated carrier wave with said reference carrier wave and providing said demodulated signal.

4,544,895

AUDIO-AMPLIFIER ARRANGEMENT

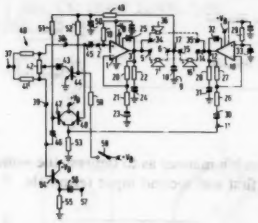
Albert Stoker, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,191

Claims priority, application Netherlands, Aug. 25, 1982, 8203325

Int. Cl.⁴ H03F *3/26, 3/68*

U.S. Cl. 330—273 **1 Claim**



1. An asymmetrically driven audio-amplifier arrangement which comprises a first amplifier circuit having an input and an output, a second amplifier circuit having an input and an output, first output terminals for connecting a first loudspeaker to the output of the first amplifier, second output terminals for connecting a second loudspeaker to the output of the second amplifier, a capacitor arranged between a first point and ground, the first output terminals being arranged between the output of the first amplifier circuit and the first point, the second output terminals being arranged between the output of the second amplifier circuit and the first point, and the first and the second amplifier circuits being adapted to carry signals of substantially opposite phase at their outputs, characterized in that third output terminals are provided between the output of the first amplifier circuit and the output of the second amplifier circuit for the connection of a third loudspeaker therebetween, a direct voltage detector is provided for detecting the magnitude of the direct voltage across the capacitor while a switchable input circuit is provided having a first state, in which an input signal capable of being balanced is applied to the first and the second amplifier circuits, and a second state, in which input signals of substantially equal magnitude are applied to the two amplifier circuits, the second state existing when the direct voltage across the capacitor is lower than a predetermined value and the first state existing when the direct voltage across the capacitor exceeds said predetermined value.

4,544,896

AMPLITUDE ADJUSTING EQUIPMENT IN A SIGNAL TRANSLATION LINE

Michitaka Osawa; Etuo Funada; Hiroyuki Miyajima; Hitoshi Maekawa, and Kunio Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 575,780, Feb. 1, 1984, abandoned. This application Mar. 11, 1985, Ser. No. 709,848

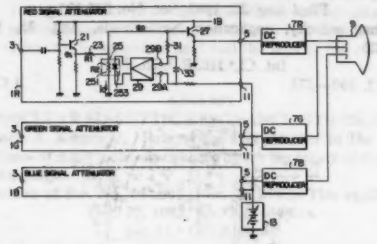
Claims priority, application Japan, Mar. 9, 1983, 58-37332

Int. Cl.⁴ H03G *3/20*

U.S. Cl. 330—284 **9 Claims**

1. An amplitude-adjusting apparatus comprising a signal input terminal supplied with a signal, a control terminal supplied with a control voltage, a signal output terminal for producing an amplitude-set signal in accordance with the control voltage, signal divider means including first and second impedance elements for dividing the signal applied to said input terminal, signal transmission means for introducing the input signal divided by the signal divider means to said signal output terminal, DC current supply means for supplying a DC current to at least one of the first and second impedance elements, and control means including a first input terminal connected to said control terminal and a second input terminal supplied with the

DC voltage generated across one of the impedance elements for controlling the impedance value of one of said impedance



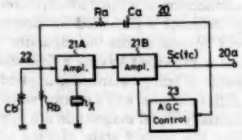
elements in such a manner as to depress the voltage difference between the first and second input terminals.

4,544,897

CRYSTAL OSCILLATOR CIRCUIT WITH FEEDBACK CONTROL

Nobuyuki Ishikawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,190
Claims priority, application Japan, Nov. 30, 1982, 57-209875
Int. Cl.[4] H03B *5/30*
U.S. Cl. 331—116 R **3 Claims**



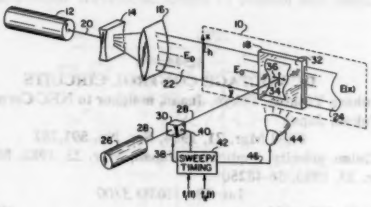
1. Oscillating circuit comprising:
a first stage amplifier having an input terminal and an output terminal;
a second stage amplifier having an input terminal connected to said output terminal of said first stage amplifier and an output terminal;
a feedback circuit connected between the output terminal of said second stage amplifier and the input terminal of said first stage amplifier and including a series circuit of a capacitor and a resistor;
a crystal resonator having a resonance frequency determined by a mechanical property of a crystal and connected to said first stage amplifier; and
means for determining the total gain of the circuit such that the oscillating condition is satisfied at a frequency near said resonance frequency of said crystal resonator, said total gain determining means including a gain control circuit having a detector for detecting an output signal at the output terminal of said second stage amplifier and a comparator for comparing the output of said detector and a reference signal and correspondingly controlling the gain of said second stage amplifier.

4,544,898

SIGNAL DEVICE EMPLOYING PHOTOREFRACTIVE AREA MODULATION

Benjamin J. Pernick, Hampton Bays, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 9, 1983, Ser. No. 492,660
Int. Cl.[4] H01S *3/00*; G02B *5/23*; G02F *1/01*
U.S. Cl. 332—7.51 **20 Claims**



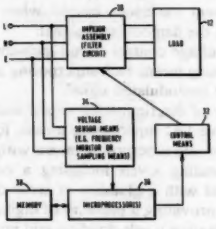
1. An optical phase modulator device, comprising
refractive means interposed along a path of propagation of an optical carrier beam and having an index of refraction which changes in response to incident light; and
writing means responsive to a temporal input signal for generating a writing beam incident upon the refractive means, said carrier beam having a phase which is modulated in an analog manner in said refractive means, said writing beam having an area of incidence on said refractive means, said area of incidence having a first spatial dimension.

4,544,899

CONTROLLED POWER LINE FILTERS FOR SUPPRESSING INTERFERENCE

Lionel B. K. Townsend, and Mary D. Townsend, both of London, England, assignors to Brydor Limited, London, England

Filed Sep. 19, 1983, Ser. No. 533,580
Claims priority, application United Kingdom, Sep. 20, 1982, 8226669
Int. Cl.[4] H03H *2/00*
U.S. Cl. 333—17 R **8 Claims**



1. A power line filter comprising:
a filter circuit for connection to a network supply, the filter circuit having a filtration characteristic that can be altered;
monitoring means for monitoring a characteristic of the network supply which characteristic is representative of the interference content of the network supply; and
a control arrangement connected to said monitoring means and to said filter circuit, said control arrangement comprising means responsive to said monitored characteristic of the network supply to alter said filtration characteristic of said filter circuit in a sense to adapt said filtration characteristic to better suppress the interference to which the input network supply is currently subjected, said control

arrangement comprising memory means storing data representing a desired network supply characteristic, and at least one microprocessor connected to said monitoring means and to said memory means, said at least one microprocessor being operative to compare said monitored characteristic with said stored data and to cause alteration of said filtration characteristic of said filter circuit in a sense to minimize any difference between said monitored characteristic and said stored data.

4,544,900

POLARIZED SIGNAL RECEIVER SYSTEM

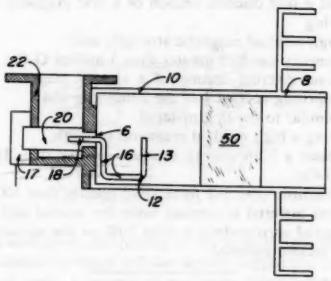
H. Taylor Howard, San Andreas, Calif., assignor to Chaparral Communications, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 322,446, Nov. 18, 1981, Pat. No. 4,414,516. This application Jul. 30, 1982, Ser. No. 403,292

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.[4] H01P 1/16

U.S. Cl. 333—21 A **5 Claims**



1. A polarized signal receiver comprising:

a first waveguide for transmitting polarized signals;

a circular waveguide for receiving polarized signals at one end and coupled to the first waveguide at the other end, said other end having a rear wall;

an insulator rod, rotatably mounted through said other end of the circular waveguide;

signal conducting means, fixedly mounted in the insulator rod concentric with the axis of rotation thereof having a receiver probe portion oriented in the circular waveguide orthogonal to the axis of said circular waveguide for receiving one polarization of the incident signal, a launch probe portion concentric with the insulator rod and extending into the first waveguide for launching said signal therein, and a transmission line portion, having a first section contoured to the inside surface of the circular wall, and substantially parallel to the axis, of the circular waveguide, and having a second section contoured to the inside surface, and substantially parallel to the plane, of the rear wall of the circular waveguide, for connecting the receiver probe portion to the launch probe portion; and

transformation means intermediate the incoming signals and the signal conducting means for transforming circularly polarized signals to linearly polarized signals.

4,544,901

MICROWAVE FILTER STRUCTURE

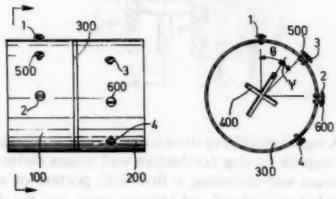
John D. Rhodes, Guiseley, United Kingdom, and Richard J. Cameron, Noordwijk, Netherlands, assignors to Agence Spatiale Europeenne, Paris, France

PCT No. PCT/BE82/00015, § 371 Date Dec. 29, 1983, § 102(e) Date Dec. 29, 1983, PCT Pub. No. WO83/04457, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 11, 1982, Ser. No. 571,556

Int. Cl.[4] H01P 1/208, 7/06

U.S. Cl. 333—212 **3 Claims**



1. A microwave filter structure comprising:

a first cylindrical cavity having a pair of tuning screws and a coupling screw, the tuning screws being located approximately 90 degrees from each other, the coupling screw being located approximately 45 degrees from each tuning screw, the first cavity having a first and a second resonance;

a second cylindrical cavity having a pair of tuning screws and a coupling screw, the tuning screws being located approximately 90 degrees from each other, the coupling screw being located approximately 45 degrees from each tuning screw, the second cavity having a third and a fourth resonance;

a coupling iris positioned between the first and second cavities;

wherein the coupling iris is located at an angle theta relative to the tuning screws of the first cavity and the second cavity is located at an angle psi relative to the coupling iris;

wherein the angles theta and psi are determined from the following equations:

$$M_{13} = -M_1 \cos(\text{theta}) \sin(\text{psi}) - M_2 \sin(\text{theta}) \cos(\text{psi});$$

$$M_{14} = M_1 \cos(\text{theta}) \cos(\text{psi}) - M_2 \sin(\text{theta}) \sin(\text{psi});$$

$$M_{23} = -M_1 \sin(\text{theta}) \sin(\text{psi}) + M_2 \cos(\text{theta}) \cos(\text{psi});$$

$$M_{24} = M_1 \sin(\text{theta}) \cos(\text{psi}) + M_2 \cos(\text{theta}) \sin(\text{psi});$$

and

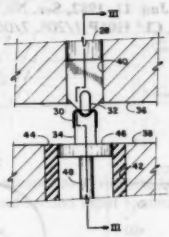
wherein the coefficients M_1 and M_2 represent the coupling values of the coupling iris, the coefficient M_{13} represents the coupling between the first and third resonances, the coefficient M_{14} represents the coupling between the first and fourth resonances, the coefficient M_{23} represents the coupling between the second and third resonances, and the coefficient M_{24} represents the coupling between the second and fourth resonances.

4,544,902

MOUNT FOR MILLIMETER WAVE APPLICATION

David L. Harris, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 21, 1983, Ser. No. 564,818
Int. Cl.[4] H01P 1/00
U.S. Cl. 333—250 8 Claims



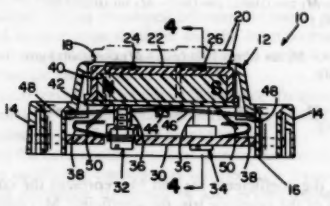
1. A signal modifying device comprising an elongate section of waveguide having conductive wall means defining an interior space and including a first wall portion of conductive material at one side of said interior space, and the device also comprising a second portion of conductive material in opposed relationship with said first portion across said interior space, and dielectric material electrically insulating said second portion of conductive material from said wall means, there being a lateral throughhole formed in one of said first and second portions of conductive material, and the signal modifying device further comprising a rod-like conductive member fitted in said hole formed in said one portion of conductive material and having one end presented towards the other of said first and second portions of conductive material, and a non-linear circuit element comprising a body of semiconductor material incorporating a pn junction, first and second electrodes connected to the body of semiconductor material at opposite respective sides of the junction, and a beam-like lead connected to said first electrode and extending from said body, said non-linear circuit element being secured to the rod-like member with said second electrode connected in electrically conductive manner to said rod-like member and said lead extending towards and in pressure contact with said other portion of conductive material.

4,544,903

ELECTRICAL CONNECTOR SYSTEM

John T. Grant, Guestwick, England, assignor to Pittway Corporation, Syosset, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,982
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—205 18 Claims



1. A security system contact assembly for building openings such as doors, windows and the like comprising
a housing of electrically insulating material,
said housing having an opening and support structure for securing said housing to a structural member,
a magnet case disposed within said housing,
said magnet case having a planar surface,
two electrically conductive contact members disposed in electrically spaced relation on said planar surface of said magnet case,
biasing means for retracting said magnet case into said housing so that the surfaces of said contact members are, below the surface of said opening, and
terminal means in said housing connected to said contact members for connection to remote circuitry.

4,544,904

COMPOSITE MAGNET AND MAGNETIC CIRCUIT

Kishore Tarachand, 928 Wright Ave. #107, Mountain View, Calif. 94043

Filed Feb. 24, 1984, Ser. No. 583,445
Int. Cl.[4] H01F 7/02
U.S. Cl. 335—302 7 Claims

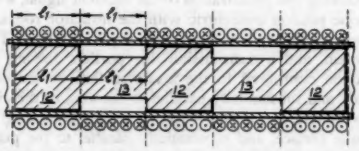
1. A composite magnet comprising:
at least a first discrete section of a first magnetic material, having
a high residual magnetic strength, and
an energy product greater than 3 million G-Oe;
a second discrete section of a second magnetic material comprising at least ⅓ of the composite and
dissimilar to the first material,
having a high residual magnetic strength,
at least a high energy product greater than 15 million G-Oe;
an intrinsic coercive force (H_{ci}) greater than 3000 Oe,
the first material in contact with the second and the first material surrounding at least 30% of the surface area of the second material.

4,544,905

LINEAR TRANSDUCERS

Christopher H. Best, Ashford, and Alec H. Scilly, North Wembley, both of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 318,269, Nov. 4, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,372
Claims priority, application United Kingdom, Nov. 18, 1980, 8036999
Int. Cl.[4] H01F 21/06
U.S. Cl. 336—136 6 Claims



1. An electrical linear transducer comprising: a tubular former having an axial extent, a plurality of windings on said former, said windings including only series connected wind-

ings and no primary and extending along the axial extent of said former, there being at least three windings, each of said windings having the same number of turns and an axial length with all of said winding axial lengths being equal and all adjacent windings being in non-overlapping side-by-side relationship on said former, said windings being wound so that immediately adjacent windings are wound in opposite directions; a cylindrical core member having an axial extent equal to the axial extent of each winding and positioned inside said tubular former to be movable axially of said former within said windings, said core member moving within said former causing the inductance of the transducer to vary from a maximum value when said core member is positioned entirely and coextensively within one of said windings to a minimum when said core member is positioned with one-half of said core member in one winding and one-half of said core member in a winding located immediately adjacent to said one winding so the inductance of the transducer varies cyclically as said core member moves axially through said former with the variation in inductance providing an indication of the extent of movement of said core member within said former.

4,544,906

TRANSFORMER HAVING COAXIAL COILS

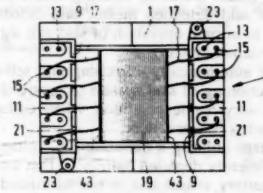
Joaquim S. Mota, V.N. Gaia, Portugal, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,102

Claims priority, application Netherlands, May 29, 1984, 8401708

Int. Cl.⁴ H01F *27/32*

U.S. Cl. 336—206 **6 Claims**



1. A transformer comprising a coil former made of an insulating material having a tubular section supporting a plurality of coaxial coils, a second of said coils being located on an electrically insulating foil wrapped around a first coil such that the foil separates the first and second coils, each of the two coils being arranged in a winding space which extends from the centre of the tubular section to both sides in the axial direction to boundaries located at a predetermined distance from the ends thereof, the foil extending in the axial direction to beyond the boundaries of at least the winding space of the first coil to substantially the ends of the tubular section, the foil being transparent with visually observable marks provided thereon at the location of the boundaries of the winding space of the first of the two coils.

4,544,907

COMPACT FUSE BLOCK ASSEMBLY

Tsunesuke Takano, Tokyo, Japan, assignor to Kabushiki Kaisha T AN T, Tokyo, Japan

Continuation-in-part of Ser. No. 515,961, Jul. 21, 1983, abandoned. This application Sep. 26, 1984, Ser. No. 655,310

Claims priority, application Japan, Aug. 5, 1982, 57-119214[U]; Aug. 5, 1982, 57-119215[U]; Aug. 5, 1982, 57-119216[U]; Aug. 5, 1982, 57-119217[U]; Jul. 12, 1983, 58-107909[U]; Jul. 12, 1983, 58-107910[U]

Int. Cl.⁴ H01H *85/24*

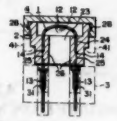
U.S. Cl. 337—262 **18 Claims**

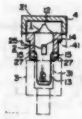
1. A fuse block assembly, comprising:

an electrically insulating fuse block, and an electrically conductive fuse element receivable in the fuse block;

said fuse element made of zinc and being substantially inverted U-shaped, having two legs, with each said leg comprising a blade-type terminal for electrical contact;

said terminals having ends which extend out of the block through respective slots formed through a wall thereof, and said legs each having step means extending transversally of said legs constructed and arranged such that when said fuse element is in a position of use received in the block said step means engage an internal face of said wall internally of said block;





the terminals being in two at least generally parallel planes which are at least generally transverse to a plane common to the legs of the U,;

the terminals being connected to each other through a fusible portion of the fuse element which fusible portion is of reduced cross-section and the melting of which in use constitutes blowing of the fuse; and

said fuse element and said block being provided with cooperating engagement means which act to hold them together in said position of use.

4,544,908

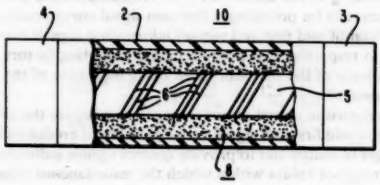
FUSE WITH ELECTRO-NEGATIVE GAS INTERRUPTING MEANS

Donald D. Blewitt, Penn Hills, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,071

Int. Cl.⁴ H01H *85/44*

U.S. Cl. 337—279 **4 Claims**



1. A fuse, comprising:

(a) an insulating housing;

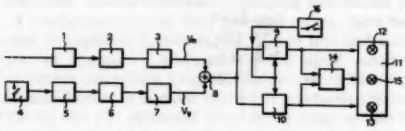
(b) electrically conductive terminal means at each end of said insulating housing for sealing the ends thereof;
(c) an elongated core traversing the entire length of the insulating housing;
(d) a fuse element helically wound around and in continuous surface-to-surface contact with the core and electrically connected to the electrically conductive terminal means; and
(e) the elongated core being composed of a non-stoichiometric oxide for evolving an arc extinguishing, electro-negative gas when heated by the combination of the heated fuse element and a resulting arc during current interruption.

4,544,909

FUEL CONSUMPTION SIGNALLING DEVICE FOR A MOTOR VEHICLE

Vittorio Di Nunzio, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Sep. 30, 1983, Ser. No. 538,038
Claims priority, application Italy, Oct. 14, 1982, 68204 A/82
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 R **7 Claims**



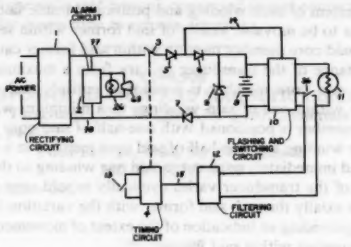
1. A signalling device for providing indications of the fuel consumption of an internal combustion engine of a motor vehicle, comprising:
first sensor means for providing an electrical signal indicative of the rate of rotation of the vehicle engine;
second sensor means for providing an electrical signal indicative of the speed of the vehicle;
a first processing circuit connected to said first sensor means and arranged to provide a first information signal having an amplitude proportional to the rate of rotation of the engine;
a second processing circuit connected to said second sensor means and arranged to provide a second information signal having an amplitude which is directly proportional to the speed of the vehicle when this speed is less than a predetermined value and a zero amplitude when the speed of the vehicle is greater than this predetermined value, said predetermined speed value being between the speed at which the fuel consumption is at a minimum under the slowest running conditions of the engine and the speed at which the fuel consumption is at a minimum under the fastest running conditions;
a first adding circuit connected to said first and second processing circuits for providing a first sum signal corresponding to the sum of said first and second information signals according to respective first predetermined weighting factors, the amplitude of the first sum signal being indicative of the fuel consumption;
first comparison circuit means arranged to compare the amplitude of said first sum signal with a plurality of predetermined ranges of values and to provide control signals indicative of the range of values within which the instantaneous value of the amplitude of said first sum signal falls, and
signalling means connected to said first comparison circuit means for providing perceptible signals indicative of the fuel consumption upon receipt of said control signals.

4,544,910

EXIT SIGN LAMP FLASHING SYSTEM WITH SELF-CHECKING PROVISIONS

Max Hoberman, R. Diskin 5 K. Wofson, Jerusalem, Israel

Filed May 10, 1982, Ser. No. 376,759
Int. Cl.[4] G08B *1/00, 21/00;* H02J *7/04*
U.S. Cl. 340—333 **5 Claims**



1. An emergency exit sign auxiliary lamp illumination system operative in response to the failure of electrical power mains voltage, the improvement including:
(a) switch means to interrupt electrical power to a portion of said system and activating said switch means automatically at periodic intervals by included timing means;
(b) alarm means including visual and/or audible signal indications, said alarm means operative upon interruption of electrical power mains voltage to actuate said portion of said exit sign auxiliary lamp illumination system;
(c) detection means including filtering means for delaying response of said detection means, said detection means responsive to normal operation of said exit sign auxiliary lamp illumination system;
(d) means for automatically exercising and self-testing the proper functioning of said system to insure the system's being in a serviceable condition when called upon to function during power failure;
(e) circuit means utilizing a pulsating DC voltage to determine a sufficiently depleted battery so that current drain from the battery ceases and is not continued beyond a determined limit, the pulsating DC voltage sent across a transistor coupled to a capacitor, thence through a diode, the ceasing being with a DC voltage insufficient to maintain appreciable base current to an associated transistor, and
(f) restoring means to restore power to said portion of said auxiliary lamp illumination system, said restoring means operative upon detection of normal auxiliary lamp operation by said detection means.

4,544,911

LOW COST MONOTONIC DIGITAL-TO-ANALOG CONVERTER

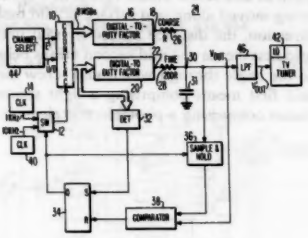
Ted N. Altman, E. Windsor, and Nicola J. Fedele, Kingston, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 31, 1983, Ser. No. 528,046
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA **17 Claims**

1. In a digital-to-analog converter which generates an analog output signal subject to periodically occurring non-monotonic increments in response to consecutive increments of the value of a digital word, apparatus for substantially reducing magnitude disturbances of said analog signal caused by said non-monotonic increments comprising:
means for detecting the occurrence of each of said non-monotonic increments of said analog signal;
means for rapidly changing the value of said digital word so as to rapidly change the magnitude of said analog signal in response to the detection of the occurrence of each of said non-monotonic increments;

means for storing signals having magitudes related to the magnitudes of said analog signal prior to each of said non-monotonic increments; and

sensing means having a first input responsive to the magnitude of said analog signal and a second input responsive to the magnitude of said stored signal for stopping said rapid changing of the value of said digital word when the magnitude of said analog signal corresponds to the magnitude of said stored signal.

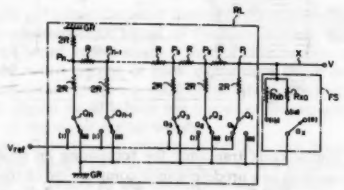


4,544,912

SCALE SWITCHABLE DIGITAL-TO-ANALOG CONVERTER

Hiromu Iwamoto, and Haruo Tamada, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 183,735, Sep. 30, 1980, abandoned. This application Jan. 27, 1984, Ser. No. 574,209
Claims priority, application Japan, Sep. 4, 1979, 54-113289
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD **7 Claims**



1. An A/D converter system receiving a scale switching signal and comprising:

a comparator for receiving an analog input voltage and producing a comparator output;

a register, operatively connected to said comparator, for storing binary data and changing the binary data in dependence on the comparator output; and

a D/A converter, operatively connected to said comparator and said register, for producing a D/A analog signal from the binary data and producing an output voltage at an output impedance, said comparator comparing the analog input voltage and the D/A analog signal and producing the comparator output, said D/A converter comprising:

a ladder switching circuit, operatively connected to said register and having a ladder circuit output operatively connected to said comparator, for producing a ladder switching circuit signal from the binary data; and

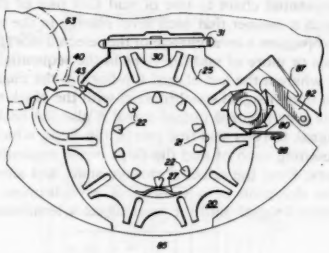
a full scale switching circuit, operatively connected between the ladder circuit output and a reference voltage and to receive the scale switching signal, and including a scale control resistor, for selecting the value of the resistance of the scale control resistor responsive to the scale switching signal, so that the output voltage and the output impedance of said D/A converter is selected responsive to the scale switching signal.

4,544,913

FAST INDEXING ENCODER APPARATUS

Phillip D. Van Buren, Scottsdale, and Edgar J. Abt, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 22, 1983, Ser. No. 534,994
Int. Cl.[4] G08C *9/08*
U.S. Cl. 340—347 P **4 Claims**



1. Fast indexing encoder apparatus comprising:

a plurality of rotatable mounted members each individually rotatable, each of said members including a Geneva gear formed in an outer periphery thereof;

each of said members having a fixed electrical contact associated therewith;

each of said members further having an electrical wiper contact mounted for rotation therewith and electrically connected to said fixed contact;

a plurality of electrical conductors mounted adjacent said members for sequential engagement with said wiper contacts of each of said members as said members are rotated, said conductors being further mounted so that each wiper engages only one conductor at any time;

Geneva gear driving means mounted in engagement with the Geneva gears formed in said plurality of members and including a common control for rotating a selected one of said plurality of members in response to operation of said common control; and

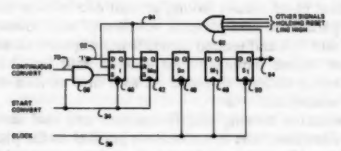
locking means mounted adjacent said plurality of members and including a single control for engaging and preventing rotation of all but a selected one of said plurality of members in response to the operation of said single control.

4,544,914

ASYNCHRONOUSLY CONTROLLABLE SUCCESSIVE APPROXIMATION ANALOG-TO-DIGITAL CONVERTER

Daniel F. Chan, Huntington Beach, and Willard K. Bucklen, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 104,166, Dec. 17, 1979, Pat. No. 4,396,905. This application Apr. 22, 1983, Ser. No. 487,487
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**



1. For use in an analog-to-digital converter of the successive approximation type, of which the operation is regulated by clock signals, a control signal processing circuit comprising:

first storage means, for registering the occurence of an asynchronous converter control signal, said first storage means including a first pair of flip-flops switchable to a selected storage state in response to the occurence of the asynchronous converter control signal; and

second storage means coupled to said first storage means, for generating a synchronous converter control signal upon the occurence of a clock signal after said first storage means has registered the occurence of an asynchronous converter control signal, said second storage means including a plurality of additional flip-flops coupled in a sequential chain to one of said first pair of flip-flops, in such a manner that each level change in the clock signal propagates a level change of the selected storage state into one or more of said flip-flops in the sequential chain;

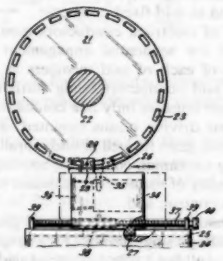
and wherein the last of said flip-flops in the chain provides an output signal synchronized with the clock signals, and the synchronized output signal is also fed back as a reset signal, to reset said first pair of flip-flops, which results in resetting each of said flip-flops in the sequential chain in turn, from the selected storage state, and also precludes the detection of a subsequent asynchronous converter control signal until the reset signal is terminated.

4,544,915

ADJUSTABLE DIGITAL ENCODER

Samuel P. Wieme, Wayne, and Robert Williams, Randolph, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Dec. 7, 1979, Ser. No. 99,432
Int. Cl.⁴ H03K *13/00*
U.S. Cl. 340—347 P **4 Claims**



1. An adjustable encoder comprising:

first means for generating a continuous first signal;

second means for generating an electrical signal responsive to said first signal;

rotatable means mounted for rotation about a selected axis, said rotatable means having a first and a second region that alternately pass between said first means and said second means as said rotatable means rotates, said first region being constructed to prevent said first signal from actuating said second means and said second region being constructed to transmit said first signal to said second means;

a first block means having at least one surface and movable parallel to said plane of rotation of said rotatable means, said first and second means being disposed on said surface;

base means having a first surface, said first block means being slidably disposed on said first surface of said base means; and

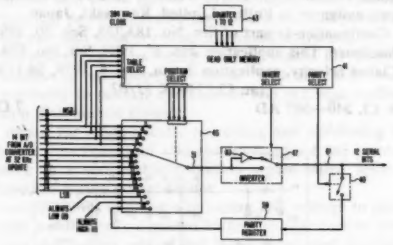
means for moving said first means and said second means simultaneously in a direction parallel to the plane of rotation of said rotatable means while said rotatable means is rotating and while said second means is generating said electrical signal; said moving means comprising screw means having an axis parallel to said plane of rotation, said first block means having therein a threaded bore threadedly receiving said screw means, and said screw means being mounted on said first surface of said base means rotatably about its said axis, said screw means and said base means cooperating to ensure that rotational adjustment of said screw means results in said first block means being moved along said surface of said base means in said direction, the distance moved by said first block means, said first means and said second means being proportional to the angle through which said screw means is rotated; said first means comprising a light source; said second means comprising a photoelectric element.

4,544,916

DIGITAL CODE TRANSLATOR

Craig A. Sharper, Haverhill, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 31, 1982, Ser. No. 413,470
Int. Cl.⁴ H04L *3/00*
U.S. Cl. 340—347 DD **7 Claims**



1. A digital code translator for translating an input PCM word according to a predetermined compression characteristic into an output PCM word having chord bits and step bits, said translation comprising:

memory means **(41, 141)** having a multiplicity of addresses for storing at each said address a table of instruction words, address inputs **(A4–A9)** and instruction word outputs **(Q0–Q5)**;

means connecting a first predetermined selection of bits of said input word to said address inputs;

selector switch means **(45, 148, 150, 152)** having instruction inputs connected to said instruction word outputs to receive said instruction words, a plurality of bits inputs **(0–15)**, and a switch output **(51, 161)** for connecting a selected one of said plurality of bit inputs to said switch output according to an instruction word;

means connecting a source of potential representative of a "1" inputs;

means connecting a source o potential representative of a zero to a second one of said bit inputs; and

means connecting a second predetermined selection of bits of said input word to others of said bit inputs, respectively;

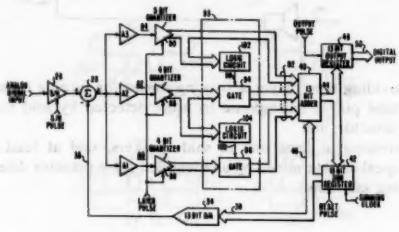
respective instruction words of said tables directing said switch to select said chord bits from among said first and second ones of said bit inputs and to select said step bits from among said others of said bit inputs according to said predetermined compression characteristic to generate said output word.

4,544,917

A/D CONVERTER HAVING DIGITALLY CONTROLLED SUBRANGING AND SELF-ALIGNMENT APPARATUS FOR USE THEREIN

John G. Lenhoff, Jr., Linthicum, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 16, 1982, Ser. No. 418,944
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 AD **8 Claims**



1. A subranging analog-to-digital (A/D) converter for converting a sampled analog input signal into corresponding n-bit digital words representative thereof comprising:

an arithmetic unit for generating a series of error signals for each analog input signal sample, said error signals of a series being representative of the differences between a signal representative of the corresponding analog input signal sample and a respectively corresponding series of feedback signals associated therewith;

a plurality of parallel network branches for operating on each error signal simultaneously, each network branch i of said plurality including:

means for gain adjusting each error signal with a gain G_i; and

an m_i-bit quantizer cascaded therewith for converting each gain adjusted error signal of the branch i into an m_i-bit digital word representative thereof, the m_i bits of said digital word output of each quantizer i being assigned predeterminately to a portion of the bits of an intermediate n-bit digital word which has a greater bit capacity than any of the m_i-bit digital words;

said gain G_i increasing progressively from one branch i to another branch i+1 in accordance with a predetermined range of quanta of the corresponding quantizers associated therewith;

means for selecting at least one digital word conversion from the plurality of simultaneous conversions for each error signal based on the digital codes thereof to form said intermediate n-bit digital word corresponding to each error signal:

said selecting means including:

a digital date for each network branch except the branch having the lowest gain, each digital gate disposed in cacade with its corresponding branch quantizer and governed by a gate command signal to select the digital word conversion of its corresponding quantizer as a constituent in the formation of said intermediate n-bit digital words in accordance with the bit assignment thereof; and

means for generating the gate command signals by generating the gate command signal for said digital gate of branch i+1 based on the conversion digital code of the quantizer output of branch i;

means for accumulating each series of formed intermediate n-bit digital words by generating an intermediate accumulated n-bit digital word corresponding to each formed intermediate n-bit digital word of said series, each generated series of intermediate accumulated n-bit digital words being respectively representative of said series of feedback signals in accordance with their accumulating sequence; and

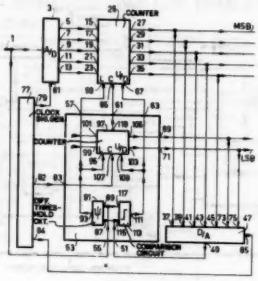
means for storing the final accumulated n-bit digital word for each accumulating series of formed intermediate n-bit digital words as the n-bit digital word conversion of its corresponding analog input signal sample.

4,544,918

ANALOG-TO-DIGITAL CONVERSION CIRCUIT

Gerard De Haan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1983, Ser. No. 523,526
Claims priority, application Netherlands, Sep. 3, 1982, 8203446
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 AD **5 Claims**



1. An analog-to-digital conversion circuit comprising:

an analog-to-digital converter having an input coupled to an input of the conversion circuit for receiving an input signal to be converted, and a plurality of outputs;

a counter having counting position inputs coupled, respectively, to the plurality of outputs of said analog-to-digital converter, and counting position outputs coupled to respective outputs of the conversion circuit for forming the most significant bits of an output signal from the conversion circuit;

a digital-to-analog converter having inputs coupled, respectively, to the counting position outputs of said counter, and an output; and

a difference threshold circuit having a first input for receiving the input signal to the conversion circuit, and a second input coupled to the output of said digital-to-analog converter, said difference threshold circuit having an output coupled to a counting position writing input of said counter for supplying thereto a signal when the difference between said input signal and the output of said digital-to-analog converter is larger than a predetermined value; characterized in that said analog-to-digital conversion circuit further comprises:

a fine analog-to-digital converter having inputs for receiving said input signal and the output from said digital-to-analog converter, and outputs coupled to further inputs of said digital-to-analog converter and to further outputs of the conversion circuit for forming the least significant bits of said output signal of the conversion circuit; and

a correction circuit having inputs for receiving said input signal and the output of said digital-to-analog converter, and outputs coupled to a further input combination of said counter for correcting the counting position thereof for slow amplitude variations of the input signal to be converted, whereby, depending on the magnitude of said slow variations, said fine analog-to-digital converter provides an output signal indicative of this variation and said correction circuit causes said counter to update the output signal therefrom when said variations exceed a certain magnitude, and upon fast amplitude variations, said difference threshold circuit causes said counter to assume the output signal of said analog-to-digital converter and there-

after said fine analog-to-digital converter and said correction circuit modify the output signal of the conversion circuit accordingly.

4,544,919

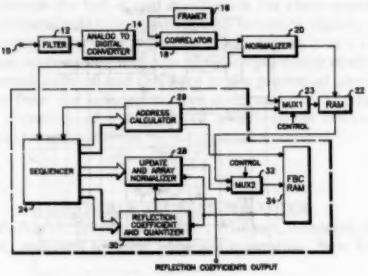
METHOD AND MEANS OF DETERMINING COEFFICIENTS FOR LINEAR PREDICTIVE CODING

Ira A. Gerson, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 454,929, Jan. 3, 1982, abandoned. This application Dec. 28, 1984, Ser. No. 687,486

Int. Cl.⁴ H03K *13/00*

U.S. Cl. 340—347 **20 Claims**



1. A method of processing a digitized electrical signal, representative of voice or similar autoregressive signal, to obtain lattice coeffieients of an inverse lattice filter that characterizes the voice signal, said method comprising the steps of:

(a) inputting said digitized waveform;

(b) selecting samples of the digital signal for a time period equal to a predetermined frame length;

(c) temporarily storing said selected digital samples;

(d) determining correlation coefficients of said selected samples;

(e) calculating and storing initial values of F,B, and C arrays, wherein said matricies indicate the correlation values of the forward residual, backward residual, and values of cross correlation for forward and backward residuals, respectively;

(f) calculating a first reflection coefficient from said stored initial values of said F, B, and C arrays wherein said calculated first reflection coefficient indicates the partial correlation between said forward and backward residuals;

(g) outputting said first reflection coefficient to an output register, from which said coefficients are available for use in modifying the characteristics of the inverse lattice filter;

(h) adjusting said stored values of F, B, and C matricies to reflect the new values of forward and backward residuals calculated from said first reflection coefficient and previous forward and backward residuals; and

(i) repeating the steps of calculating, outputting and adjusting until a predetermined number of reflection coefficients has been obtained.

4,544,920

INTRUSION DETECTOR AND METHOD

Jerry J. Hamlin, 2356 N. 64th St., Mesa, Ariz. 85205

Filed Oct. 27, 1982, Ser. No. 437,156

Int. Cl.⁴ G08B *13/00, 15/00*

U.S. Cl. 340—565 **4 Claims**

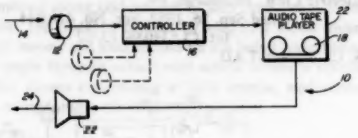
4. A method for protecting an unoccupied building which comprises the steps of:

placing a plurality of noise detectors within said building to detect noise of attempted entry;

providing a tape player within said building;

providing said tape player with a continuous play tape recording of a sounds of an excited dog;

placing a plurality of speakers within said building for broadcasting said recording played on said tape player;



providing tape player activating means for turning on said tape player in response to noise detected by said noise detector; and

activating at least one of said speakers, said at least on speaker determined by an identified noise detector detecting said noise.

4,544,921

FIRE ALARM SYSTEM

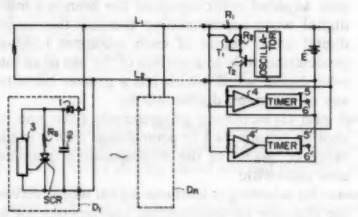
Takao Fujisawa, Omiya, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 421,911

Claims priority, application Japan, Oct. 9, 1981, 56-160281

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—584 **6 Claims**



1. A fire alarm system comprising:

(a) a pair of alarm lines having a proximal end and a distal end;

(b) a plurality of fire detectors connected between said alarm adjacent said distal end, each of the fire detectors producing an alarm signal and including a series resistor;

(c) a receiving unit connected between said lines adjacent said proximal end and generating a fire alarm in response to an alarm signal, the receiving unit including a parallel circuit which includes a voltage-dropping resistor and a switching means, said parallel circuit being in series between a voltage source and one of the alarm lines;

(d) an oscillator circuit for turning the switching means on and off; and

(e) at least one circuit for comparing the voltage at the junction of the voltage-dropping line and the alarm line with a predetermined voltage,

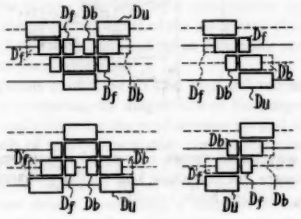
whereby on disconnection of an alarm line, the number of fire detectors which may have produced alarm signals, and like information can be determined by monitoring the voltage at said junction when the switching means is turned off.

4,544,922

SMOOTHING CIRCUIT FOR DISPLAY APPARATUS

Toshiaki Watanabe, Tokyo; Toshifumi Uenishi, Kamakura; Hiroshi Sahara, Yokohama, and Katsumi Yamaoka, Hatogaya, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 437,114
Claims priority, application Japan, Oct. 29, 1981, 56-173395
Int. Cl.[4] G09G 1/08
U.S. Cl. 340—728 5 Claims



1. A smoothing circuit for a display apparatus in which a desired character composed of selected standard width dots of a matrix of orthogonally disposed rows and columns thereof is displayed on a screen during scanning of the latter in horizontal and vertical directions; comprising:

memory means for memorizing data $R(t_{n-1})$, $R(t_n)$, $R(t_{n+1})$, $D(t_{n-1})$, $D(t_n)$ and $D(t_{n+1})$, in which D represents data indicating the presence or absence of a dot in a row of said matrix being currently displayed, (t_n) represents a time interval corresponding to the horizontal scanning of a space being considered in a given one of said rows and which has a width equal to that of each of said dots, (t_{n-1}) and (t_{n+1}) are equivalent time intervals immediately preceding and following, respectively, said time interval (t_n), and R represents data indicating the presence or absence of a dot in a row of said matrix which is immediately adjacent to said row being currently displayed;

logical operation circuit means responsive to said data memorized in said memory means for performing logical operations thereon which satisify predetermined conditions so as to selectively alter said data $D(t_n)$ in correspondence with the addition or removal, in said space being considered, of a small dot having a width one-third of said standard width, said predetermined conditions satisfied by said logical operations being as follows:

(a) The condition for altering said data $D(t_n)$ in correspondence with the addition of said small dot in the front third of said space being considered is

$$\overline{R(t_{n-1})}\cdot R(t_n)\cdot D(t_{n-1})=1$$

(b) The condition for altering said data $D(t_n)$ in correspondence with the addition of said small dot in the rear third of said space being considered is

$$R(t_n)\cdot\overline{R(t_{n+1})}\cdot D(t_{n+1})=1$$

(c) The condition for altering said data $D(t_n)$ in correspondence with the removal of said small dot from the front third of a standard width dot in said space being considered is

$$\overline{R(t_{n-1})}\cdot\overline{R(t_n)}\cdot R(t_{n+1})\cdot\overline{D(t_{n-1})}\cdot\overline{D(t_{n+1})}=1$$

and

(d) The condition for altering said data $D(t_n)$ in correspondence with the removal of said small dot from the rear third of a standard width dot in said space being considered is

$$R(t_{n-1})\cdot\overline{R(t_n)}\cdot\overline{R(t_{n+1})}\cdot\overline{D(t_{n-1})}\cdot\overline{D(t_{n+1})}=1;$$

and

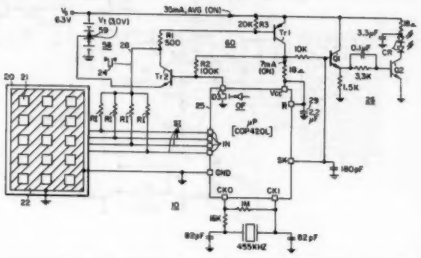
means for displaying on said screen said desired character as modified in accordance with said selectively altered data so that the displayed character has relatively smooth contours.

4,544,923

MICROPROCESSOR SELF-TURN-OFF ARRANGEMENT FOR A CONSUMER INSTRUMENT

Harold Blatter, Indianapolis, and Joseph E. S. Amaral, Carmel, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 22, 1982, Ser. No. 452,114
Int. Cl.[4] H04Q 9/00; G06F 1/00; H04B 9/00
U.S. Cl. 340—825.69 9 Claims



1. An on-off arrangement for a digital controller operated by a microprocessor in a power-up condition, comprising:

a DC power supply for developing a DC voltage at a DC voltage supply terminal of said digital controller for providing main power thereto;

a switch having a main current path coupled between said DC voltage supply terminal and a supply terminal of said microprocessor, conduction in said main current path being controlled by a control terminal of said switch;

means for forming a regenerative latch coupled to said switch control terminal to maintain said main current path conductive once said latch is energized;

means coupled to said switch control terminal for applying a turn-on signal thereto to initiate the conduction of current in said main current path from said DC voltage supply terminal to the microprocessor supply terminal to power-up said microprocessor and activiate said digital controller, said latch being energized upon application of said turn-on signal; and

an output port of said said microprocessor coupled to a point in the regenerative current path of latch for providing an alternate path via said output port for current that bypasses at least a portion of said latch to initiate a regenerative deenergization thereof for cutting off conduction in said main current path to power-down said microprocessor.

4,544,924

ON-OFF ARRANGEMENT IN A MICROPROCESSOR CONTROLLED REMOTE TRANSMITTER FOR A CONSUMER INSTRUMENT

Michael P. French, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 22, 1982, Ser. No. 452,115
Int. Cl.[4] H04Q 9/00; G06F 1/00
U.S. Cl. 340—825.69 16 Claims

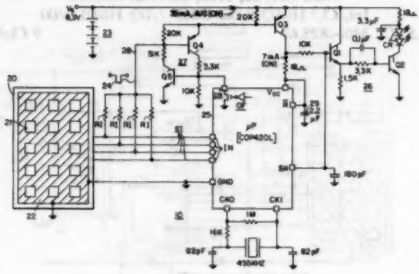
1. An on-off arrangement for a digital controller operated by a microprocessor in a power-up condition, comprising:

a DC power supply for developing a DC voltage at a DC

voltage supply terminal of said digital controller for providing main power thereto;

a semiconductor switch having a main current path coupled between said DC voltage supply terminal and a supply terminal of said microprocessor, conduction in said main current path being controlled by the conduction in a control current path of said switch such that when a control current flows in said control current path, conduction in said main current path is enabled;

a latching arrangement exclusive of said switch coupled to the control current path of said switch for receiving said control current when said latching arrangement is energized;



means responsive to a turn-on signal for energizing said latching arrangement to receive said control current for initiating the conduction of current in the main current path of said semiconductor switch from said DC voltage supply terminal to the microprocessor supply terminal to power-up said microprocessor and activate said digital controller;

an output port of said microprocessor coupled to a first control terminal of said latching arrangement, said microprocessor switching the state of said output port to provide an alternate path for current via said output port that bypasses at least a portion of said latching arrangement for initiating a regenerative deenergization thereof to cut off conduction in the main current path of said semiconductor switch to power-down said microprocessor.

4,544,925

ASSEMBLY OF MAIN AND AUXILIARY ELECTRONIC SCANNING ANTENNAS AND RADAR INCORPORATING SUCH AN ASSEMBLY

Serge Drabowitch, and Guy Leterrier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 2, 1982, Ser. No. 404,490

Claims priority, application France, Aug. 7, 1981, 81 15362

Int. Cl.⁴ G01S 7/36

U.S. Cl. 343—18 E **10 Claims**

1. An antenna for an electronic scanning radar having a main beam and at least one auxiliary beam, comprising:

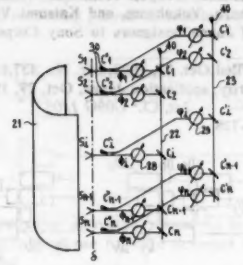
radiation source means for producing a group of outputs;

first adjustable phase shift means, connected to said source means, for focussing said outputs in accordance with a single polarization so as to form a main channel corresponding to said main beam;

first waveguide means, connected to said first phase shift means, for collecting said main channel and providing a main beam output;

directional coupler means connected between said source means and said first phase shift means, for sampling part of said outputs and producing a sampled output;

second adjustable phase shift means, connected to said coupler means, for focussing said sampled outputs in accordance with said single polarization so as to form at least one auxiliary channel corresponding to said at least one auxiliary beam; and



second waveguide means, connected to said second phase shift means, for collecting said auxiliary channel and providing auxiliary beam outputs.

4,544,926

ADAPTIVE JAMMING-SIGNAL CANCELER FOR RADAR RECEIVER

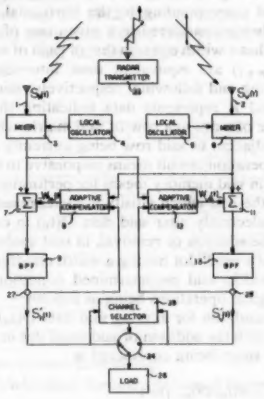
Dino Giuli, Florence, Italy, assignor to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed May 10, 1982, Ser. No. 376,717

Claims priority, application Italy, May 11, 1981, 48438 A/81

Int. Cl.⁴ G01S 7/36

U.S. Cl. 343—18 E **4 Claims**



1. A receiver for echoes of radar signals sent out by an associated transmitter, said echoes being accompanied by interfering signals from a jammer, comprising:

antenna means feeding respective incoming signals, derived from incident waves with mutually orthogonal linear polarization, to a first and a second channel;

a first algebraic summing circuit in said first channel with a first additive input port, a first subtractive input port and a first output port;

a second algebraic summing circuit in said second channel with a second additive input port, a second subtractive input port and a second output port;

a first adaptive compenator associated with said first channel and provided with input connections including a supply lead extending from said first output port and a feedback lead extending from said second input port, said first compensator further having an output lead connected to

said first subtractive input port, said first additive input port receiving the incoming signal of said first channel;

a second adaptive compensator associated with said second channnel and provided with input connections including a supply lead extending from said second output port and a feedback lead extending from said first input port, said second compensator further having an output lead connected to said second subtractive input port, said second additive input port receiving the incoming signal of said second channel, each of said compensators emitting on the respective output lead thereof a cancellation signal converting the incoming signal of the associated channel into a purged signal by suppressing an intefering component accompanying same; and

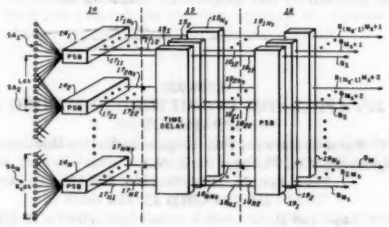
selection means connected to said first and second output ports for comparing the magnitudes of the purged signals thereof and delivering the predominant purged signal to a load, each of said compensators comprising mixer means homodyning the purged signal from the associated channel with the incoming signal from the opposite channel, said mixer means comprising a detector having inputs respectively connected to said supply and feedback leads and a modulator having inputs respectively connected to said supply lead and, by way of a narrow-band low-pas filter, to an output of said detector.

4,544,927

WIDEBAND BEAMFORMER

Richard R. Kurth, Sudbury, and Robert A. Gabel, Acton, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,258
Int. Cl.⁴ H01Q *3/22, 3/24, 3/26*
U.S. Cl. 343—373 **5 Claims**



1. A wideband beamformer comprising:

first beamforming means having means for coupling to an array of sensor elements for forming sets of sector beams numbering N, each set having a number N_S of sector beams, equal for all sets, each sector beam covering an angular sector, thereby providing a total of NN_S sector beams, said sector beams of said sets being in a one-to-one correspondence with corresponding sector beams covering like angular sectors and said sector beams of each set in totality spanning an angular region and for providing signals representative of said sector beams at output terminals, said output terminals being in one-to-one correspondence with said NN_S sector beams for providing time delays to said sector beam representative signals for time aligning representative signals of corresponding sector beams; and

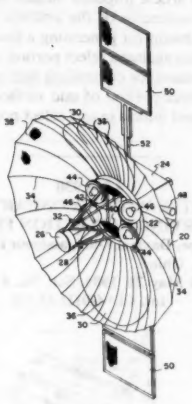
second beamforming means having input terminals coupled to receive said time aligned sector beam representative signals for providing phase-shifts to said time aligned sector beam representative signals to form sub-sector beams, numbering M_S, within and angularly spanning each sector beam, thereby providing M_SN_S sub-sector beams.

4,544,928

MULTIFREQUENCY REFLECTOR ANTENNA

Mostafa S. Afifi, King of Prussia, and Frank R. Chiappetta, Berwyn, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Jul. 16, 1980, Ser. No. 169,272
Int. Cl.⁴ H01Q *1/28, 19/12*
U.S. Cl. 343—781 P **15 Claims**



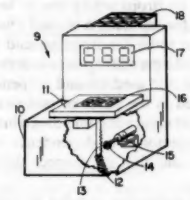
1. A multifrequency antenna comprising: a main reflector for signals in a first frequency band, a portion of the surface of said main reflector being deformed in curvature to form an auxiliary reflector for signals in a second frequency band higher than said first frequency band, the deformation of curvature being such as to minimize degradation of the performance of said main reflector.

4,544,929

WEIGHING APPARATUS AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 167,673, Jul. 11, 1980, Pat. No. 4,342,038. This application Jul. 23, 1982, Ser. No. 401,116
The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.
Int. Cl.⁴ G01D *9/00, 9/40;* **G01G** *23/38*
U.S. Cl. 346—9 **20 Claims**



1. A weighing and marking apparatus comprising in combination with a support including first means adapted to receive an article, second means supported by said support responsive to the weight of an article disposed on said first means for sensing the weight of said article and generating an electrical signal which signal is representative of the article's weight, third means for providing a plurality of visually readable indicia against the surface of an article disposed on said first means, control means for said indicia providing means for varying the operation thereof to cause same to vary the characteristics of

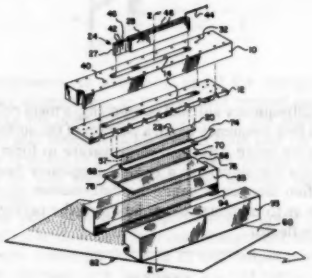
the indicia it applies to the surface of said article, said control means being operatively connected to said means responsive to the signals generated by said sensing means sensing the weight of an article and operable to predeterminately vary the operation of said third means while an article is disposed on said first means, fourth means operable after said third means has been predeterminately varied in its operation and detects the weight of an article to permit said third means to provide indicia on the surface of an article disposed on said first means wherein said indicia are indicative of the article's weight, said third means including means for generating a beam of radiation and directing said beam against a select portion of an article on said first means and means for controlling said radiation beam as it intersects said select portion of said surface of said article to cause it to form said indicia in said select portion of the surface of said article.

4,544,930

INK JET PRINTER WITH SECONDARY, CYCLICALLY VARYING DEFLECTION FIELD

Suresh C. Paranjpe, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 21, 1984, Ser. No. 612,110
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **12 Claims**



1. An ink jet printer for printing on a moving print-receiving medium, comprising:

print head means for producing a plurality of jet drop streams directed at said medium, said streams being arranged in a row which is oblique with respect to the direction of movement of said medium,

charging means for selectively inducing a first, non-zero charge level on drops which are to be deposited on said medium and for inducing a second charge level on drops which are not to be deposited on said medium,

means for providing a static primary deflection field extending parallel to said medium and perpendicular to said row and positioned in the paths of said streams, said primary deflection field separating said drops into print trajectories and catch trajectories in dependence upon whether said drops carry said first or second charge levels, respectively,

catcher means, extending parallel to said row of jet drop streams and positioned generally between said print head means and said medium, for catching drops in said catch trajectories, and

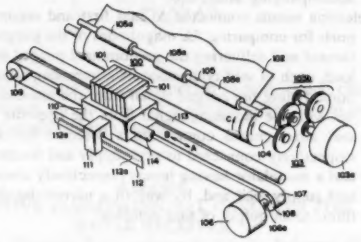
means for providing a cyclically varying secondary deflection field extending parallel to said primary deflection field and positioned in the path of said streams, said secondary deflection field separating drops having said first non-zero charge level into varying trajectories in dependence upon the strength of the secondary deflection field at the time that the drops pass therethrough, whereby the drops from each jet drop stream may be deflected into at least two print trajectories for deposit at two positions on the print receiving medium.

4,544,931

LIQUID JET RECORDING APPARATUS

Yoshitaka Watanabe, Tokyo, and Takashi Endo, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,397
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **18 Claims**



1. A liquid jet recording apparatus using recording liquid having physical properties depending upon an ambient temperature, comprising:

(A) liquid jet recording means having a controllable recording speed for recording by jetting said recording liquids;

(B) temperature detecting means for detecting said ambient temperature; and

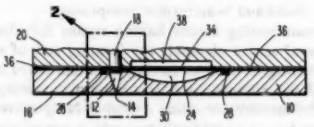
(C) control means for controlling the recording speed of said recording means in accordance with the ambient temperature detected by said temperature detecting means.

4,544,932

INK JET APPARATUS AND METHOD OF MAKING THE APPARATUS

Don C. Barnett, Berwyn, Pa., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 26, 1984, Ser. No. 604,128
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **19 Claims**



1. An ink jet apparatus comprising:

means for forming an ink jet chamber having an orifice;

transducer means including a transducer and supporting structure juxtaposed to said chamber;

a diaphram between said means for forming a chamber and said transducer means;

compliant material located between said transducer means and said diaphram; and

spacer means also located between said diaphram and said transducer means, the overall thickness of said compliant material being controlled by the thickness of said spacer means.

4,544,933

APPARATUS AND METHOD FOR INK DROPLET EJECTION FOR A PRINTER

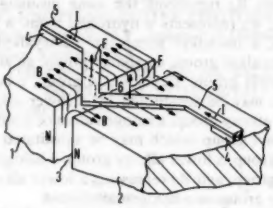
Joachim Heinzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,146

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333939

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **8 Claims**



1. Apparatus for generating individual ink droplets in an ink jet printer having individually drivable discharge elements for ejecting droplets from discharge openings associated therewith and which communicate with an ink jet chamber comprising, in combination;,

a common ink channel for a series of discharge elements, a plurality of conductive drive elements, one for each of said discharge openings, said drive elements each being secured at both sides of the ink channel and having a movable central part within said ink channel, said central part being associated with an individual discharge opening, a magnet system for generating a magnetic field penetrating at least the movable central parts of all drive elements, such that said central part is caused to move in the direction toward the ejection opening in response to a change in current flow through said element.

4,544,934

DRIVING CIRCUIT FOR AN ELECTROSTATIC RECORDING HEAD

Fumio Owada, Hachioji, and Yoshiko Yamaguchi, Tondabayashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 12, 1983, Ser. No. 513,027

Claims priority, application Japan, Aug. 26, 1982, 57-148250

Int. Cl.[4] G01D *15/06;* **H03K** *17/00*

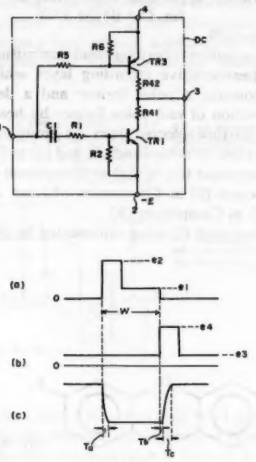
U.S. Cl. 346—154 **9 Claims**

1. A driving circuit for driving an electrostatic recording head with high voltage driving output pulses having a reduced turn-off, storage and turn-off time, comprising:

mutually complementary first and second transistors, each having a base and emitter and commonly interconnected collectors;

a first input terminal, for receiving a first driving signal, coupled to the base of said first transistor and to the base of said second transistor, and means for producing said first driving signal, said first driving signals corresponding to picture signals to be recorded by the recording head and having at least first and second non-zero signal levels during a period of time when the picture signals are supplied to the driving circuit, the first of said non-zero signal levels is the highest and occurs during a beginning portion of said time period;

a second input terminal, for receiving a second driving signal, coupled to the emitter of said second transistor, and means for producing said second driving signal, said second driving signal having at least first and second non-zero signal levels the first non-zero signal level of said second driving signal being higher than the second non-zero signal level of said second driving signal and occurring substantially at an end portion of the second non-zero signal level of said first driving signal;



a high voltage potential source coupled to the emitter of said first transistor; and

an output terminal coupled to the interconnection of the collectors of said first and second transistors.

4,544,935

RECORDING APPARATUS

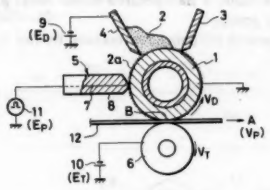
Katsuo Sakai, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jun. 10, 1982, Ser. No. 386,912

Claims priority, application Japan, Jun. 11, 1981, 56-88902

Int. Cl.[4] G01D *15/06*

U.S. Cl. 346—155 **16 Claims**



1. A recording apparatus comprising:

a toner carrier which is driven to move along a predetermined path through a transfer region at a first velocity;

means for forming a toner layer on a surface of said toner carrier, said toner layer being charged to a first polarity and having a predetermined thickness;

a recording head for selectively recharging said toner layer with a second polarity opposite to said first polarity thereby forming an electrostatic latent image having a desired pattern; and

means for advancing a transfer medium at a second velocity which is slower than said first velocity through a transfer region where said electrostatic latent image is transferred onto said transfer medium with an increase of image density.

4,544,936

HEAT-SENSITIVE RECORDING SHEET

Naoki Yokoi, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

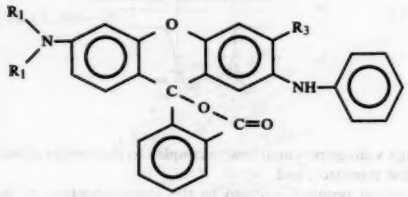
Filed May 31, 1983, Ser. No. 499,663
Claims priority, application Japan, May 28, 1982, 57-90812
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—209 **21 Claims**

1. A heat-sensitive recording sheet comprising a base having thereon a heat-sensitive recording layer which contains, as main components, a color former and a developer which causes coloration of said color former by heating, said color former is a mixture selected from the group consisting of:

(1) at least one of compounds (i) and (ii) as Component (A), and compound (iii) or (iv) as Component (B); and

(2) compound (ii) as Component (A) and compounds (iii) and (iv) as Component (B)

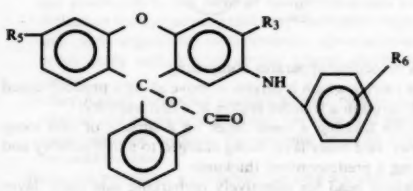
said compound (i) being represented by the formula (I)



(I)

wherein R_1 represents a hydrogen atom, a methyl group, an ethyl group, a halogenated methyl group, a halogenated ethyl group, an alkoxyalkyl group, an acyloxyalkyl group, an allyl group, a propargyl group, a cyclohexyl group, an acetoxy group, a benzyl group which may be substituted by a lower alkyl group, a lower alkoxy group, a halogen atom or a nitro group, or a phenyl group which may be substituted by a lower alkyl group, a lower alkoxy group, a halogen atom or a nitro group, and R_3 represents a hydrogen atom, a lower alkyl group, an alkoxy group, an aryl group, a halogen atom, a halogenated lower alkyl group or an acetoxy group;

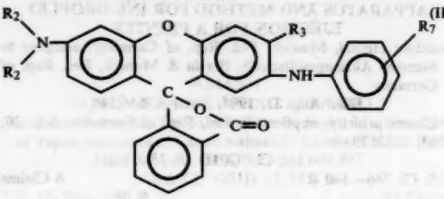
said compound (ii) being represented by the formula (II)



(II)

wherein R_3 represents the same meaning as defined above, R_5 represents a pyrrolidino group or a piperidino group, and R_6 represents a hydrogen atom, a lower alkyl group, an alkoxy group or a halogen atom;

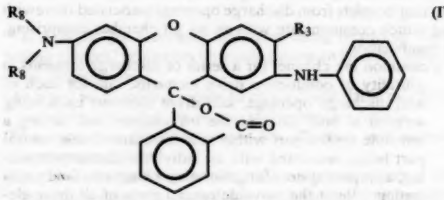
said compound (iii) being represented by the formula (III)



(III)

wherein R_3 represents the same meaning as defined above, R_2 represents a hydrogen atom, a lower alkyl group, a haloalkyl group, an alkoxyalkyl group, an acyloxyalkyl group, an alkoxy group, an allyl group, a propargyl group, a cyclohexyl group, a benzyl group which may be substituted by a lower alkyl group, a lower alkoxy group, a halogen atom or a nitro group, or a phenyl group which may be substituted by a lower alkyl group, a lower alkoxy group, a halogen atom or a nitro group, and R_7 represents a lower alkyl group, an alkoxy group or a halogen atom; and

said compound (iv) being represented by the formula (IV)



(IV)

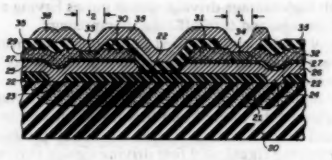
wherein R_3 represents the same meaning as defined above, and R_8 represents an alkyl group having three or more carbon atoms or a halogenated alkyl group having three or more carbon atoms.

4,544,937

FORMATION OF NORMAL RESISTORS BY DEGENERATE DOPING OF SUBSTRATES

Harry Kroger, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,514
Int. Cl.[4] H01L *39/22*
U.S. Cl. 357—5 **17 Claims**



1. A tunnel junction device for use as a gate in superconductive circuits, comprising;

a semiconductive substrate,

a degeneratively doped region within said substrate, said degeneratively doped region defining a normal resistance at superconducting temperatures,

first and second regions comprising a first layer of superconductive material spaced apart and superposed over at least portions of said normal resistance and in contact therewith,

a barrier layer deposited on said first layer of superconductive material,

a second layer of superconductive material superposed with respect to said barrier layer, and having at least one opening therethrough defining a tunneling junction area,

an insulating layer deposited on said second layer of superconductive material, having an opening defining said tunneling junction area, and

a third layer of superconductive material, superposed with respect to said insulating layer and said junction area of said barrier for electrical contact to said barrier layer.

4,544,938

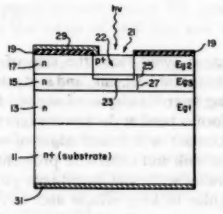
WAVELENGTH-SELECTIVE PHOTODETECTOR

Frederick Scholl, Bronx, N.Y., assignor to Codenoll Technology Corporation, Yonkers, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,677

Int. Cl.⁴ H01L *27/14, 29/161*

U.S. Cl. 357—30 **18 Claims**



1. A semiconductor device comprising:

a first semiconductor layer of a first conductivity type;

a second semiconductor layer formed on said first layer; and

a third semiconductor layer of an opposite conductivity type to said first type formed on said second semiconductor layer;

said second semiconductor layer including a first region of said opposite conductivity type adjacent to said third semiconductor layer, and a second region of said first conductivity type adjacent to said first semiconductor layer;

said two regions of said second semiconductor layer forming therebetween a PN junction and a carrier depletion region for collection of carriers generated at least in said first semiconductor layer, said depletion region encompassing at least the junction between said first and second semiconductor layers; and

said first semiconductor layer, said third semiconductor layer, and said first region having unequal bandgaps, the bandgap of said first region being greater than that of said third semiconductor layer, and the bandgap of said third semiconductor layer being greater than that of said first semiconductor layer; and further comprising

electrode means connected to said first semiconductor layer and said third semiconductor layer for coupling sources of electrical potential to said PN junction and said carrier depletion region.

4,544,939

SCHOTTKY-BARRIER DIODE RADIANT ENERGY DETECTOR WITH EXTENDED LONGER WAVELENGTH RESPONSE

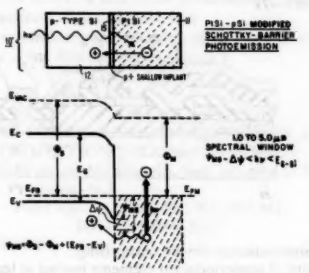
Walter F. Kosonocky, Skillman, and Hammam Elabd, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1981, Ser. No. 296,226

Int. Cl.⁴ H01L *27/14, 29/48, 31/00, 29/56*

U.S. Cl. 357—30 **4 Claims**

1. In a radiation detector for operation at temperatures low enough to avoid excessive dark current including a region of semiconductive material relatively lightly doped in its bulk and a region of a conductive material, which have respective ohmic contacts thereto and share a surface therebetween at which a Schottky-barrier contact is made, arranged for operation in a hot carrier mode to provide photoemission of charge carriers responsive to radiation entering said region of semiconductive material, the improvement for extending longer wavelength spectral response of the photoemission process wherein the doping type of said semiconductive material is such as to make the Schottky-barrier potential at said



Schottky-barrier contact less than half band gap voltage for that semiconductor material and wherein a layer of substantially higher doping concentration is formed in a portion of said region of semiconductive material immediately adjoining the surface at which said Schottky-barrier contact is made, which layer is of such thinness as to be substantially depleted of charge carriers during said operation and has a doping concentration chosen to lower the Schottky-barrier potential without undue increase in the dark current at the temperature of operation.

4,544,940

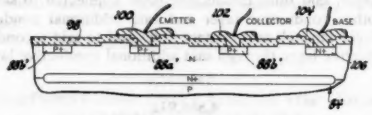
METHOD FOR MORE UNIFORMLY SPACING FEATURES IN A LATERAL BIPOLAR TRANSISTOR

John R. Weaver, II, and Nathaniel D. McClure, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1983, Ser. No. 458,166

Int. Cl.⁴ H01L *27/04, 29/06, 29/72*

U.S. Cl. 357—35 **1 Claim**



1. A lateral transistor having a precisely predictable transistor performance comprising two island-like regions of given conductivity type disposed on a semiconductor surface portion, a region of opposite conductivity type on the surface portion contiguous both island-like regions and providing a sole surface portion spacing the two island-like regions, a single step in the opposite conductivity type spacing region surface generally equidistant between the two island-like regions, a discrete electrical contact on each of said regions by which transistor operating voltages can be respectively applied to these regions, and an identical doping level in parts of the opposite conductivity type region that are contiguous to and on opposite sides of the step, representative of the use of pitch to initially delineate the two island-like regions on said semiconductor surface portion.

4,544,941

SEMICONDUCTOR DEVICE HAVING MULTIPLE CONDUCTIVE LAYERS AND THE METHOD OF MANUFACTURING THE SEMICONDUCTOR DEVICE

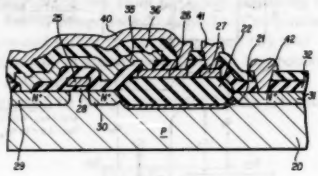
Shoji Ariizumi, and Makoto Segawa, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 16, 1981, Ser. No. 274,197

Claims priority, application Japan, Jun. 19, 1980, 55-83136; Jun. 19, 1980, 55-83137

Int. Cl.⁴ H01L *29/54, 29/78, 29/34, 29/04*

U.S. Cl. 357—71 **3 Claims**



1. A semiconductor device comprising:

a plurality of semiconductor elements having at least one PN junction, said elements being formed on a substrate;

an insulating separating layer imbedded in a portion of said substrate and raised above the surface thereof for separating, below the surface of the substrate, at least two of said semiconductor elements;

a first insulation layer formed on said substrate;

a first conductive layer comprising,

a first electrode formed on said first insulation layer,

an additional conductive layer formed on said insulating separating layer, and

another conductive layer formed on said insulating separating layer;

a second insulation layer formed on said first conductive layer;

a second conductive layer formed on said second insulation layer;

a third insulation layer formed above said second insulation layer;

a third conductive layer formed on said third insulation layer, said third conductive layer being connected by a plurality of separate conductive paths to said semiconductor elements in said semiconductor device through contact holes, every such contact hole passing through the same number of said layers of insulation, said separate conductive paths including said additional conductive layer, said third conductive layer connected to said another conductive layer and said additional conductive layer through said contact holes and to said second conductive layer through said additional conductive layer.

4,544,942

HEAT SINKS WITH STAKED SOLDERABLE STUDS

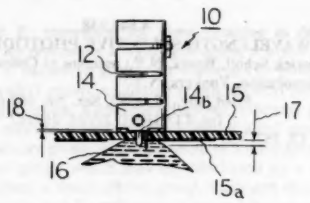
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Continuation of Ser. No. 351,012, Feb. 22, 1982, abandoned. This application Nov. 14, 1984, Ser. No. 671,033

Int. Cl.⁴ H01L *23/34, 23/40, 23/36*

U.S. Cl. 357—81 **2 Claims**

1. Heat sink apparatus fastenable with a packaged electronic device for wave-soldered mounting on a printed-circuit board, comprising a metal heat sink having cooling portions remote from a portion adapted to be mated with a packaged electronic device, and relatively thin sheet-metal mounting studs each having a substantially flat and relatively broad-area portion abutted and staked with surfaces of said cooling portions which face inwardly of the exterior of said cooling portions and each having an elongated integral solderable tab portion depending therefrom in position to project through accomodating openings in a printed-circuit board and to bond with solder which locks the tab portion with the board and thereby holds the heat sink in place atop the board, said mounting studs each having a doubly non-symmetrical aperture therethrough into which material of an abutted cooling portion of said heat sink has been cold flowed by punching, said aperture being oriented substantially centrally of said broad-area portion and having a polygonal outline imparting an angular non-symmetry to it about its center and being non-symmetrical in the transverse direction by being flared outwardly in said transverse direction away from the side of said broad-area portion which abuts said heat sink, and said tab portion of each of said studs being laterally displaced slightly from said broad-area portion to form a bend at the lower edges thereof disposed for underlying contact with lower edges of said cooling portions of said heat sink and otherwise projecting downwardly substantially parallel with said broad-area portion, said bend augmenting angular locking effects and serving as a spacer between said lower edges of said cooling portions and the top of the printed-circuit board.



4,544,943

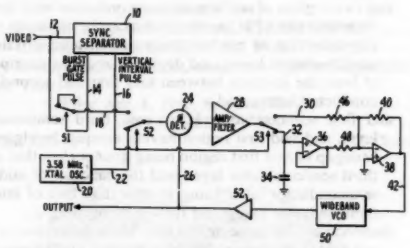
STABILIZED COLOR TELEVISION SUBCARRIER REGENERATOR CIRCUIT

Ronald Quan, 10910 Wunderlich Dr., Cupertino, Calif. 95014

Filed Dec. 2, 1983, Ser. No. 557,316

Int. Cl.⁴ H04N *9/50, 9/46*

U.S. Cl. 358—25 **12 Claims**



1. A subcarrier regenerator circuit for use in a television receiver comprising:

first oscillator means for producing a regenerator output signal at a frequency controlled by a control signal applied to a control input of said first oscillator means;

second oscillator means for producing a second output signal at a predetermined subcarrier frequency;

color burst means for producing a color burst signal derived from a video signal detected by the television receiver; and

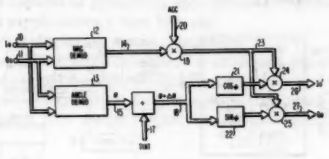
error detection means for comparing said regenerator output signal with said second output signal and with said color burst signal and producing said control signal in response to said comparisons.

4,544,944

AUTO-TINT CIRCUIT FOR A TV RECEIVER

Danny Chin, Plainsboro, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1983, Ser. No. 501,896
Int. Cl.[4] H04N *9/535, 9/32*
U.S. Cl. 358—28 **10 Claims**



10. A system for processing first and second quadrature related components of a signal comprising:

a source of said first and second components;

first means coupled to said source for generating signals representing the ratios of said first and second components;

second means including a ROM having an address input port coupled for applying said signals representing the ratios of said first and second components and programmed for generating trigonometric functions of arguments corresponding to signals applied to the address input port over a first range of said ratios and programmed for generating trigonometric functions of arguments nonlinearly related to signals applied to the address input port over a second range of said ratios; and

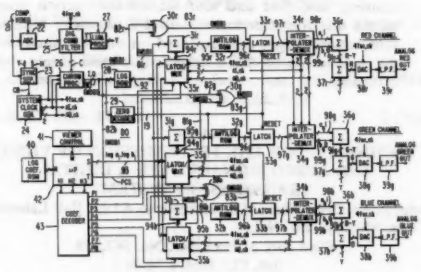
third means coupled to said source and said second means for producing third and fourth quadrature related signal components linearly related to said first and second components over said first range, and nonlinearly related to said first and second components over said second range.

4,544,945

LOGARITHMIC COLOR MATRIX FOR A DIGITAL TELEVISION RECEIVER

Henry G. Lewis, Jr., Hamilton Square, and Thomas M. Stiller, Ewing Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1983, Ser. No. 501,895
Int. Cl.[4] H04N *9/52, 9/32*
U.S. Cl. 358—30 **14 Claims**



11. A multiplexed color matrix for a digital television receiver, comprising:

means for generating first color mixture digital signals in binary-coded form representing color picture information as components in a first color mixture coordinate system;

means for generating digital coefficients in binary-coded form that enable said first color mixture digital signals to be tranformed into second color mixture digital signals representing said color picture information as components in a second color mixture coordinate system;

means for storing said digital coefficients;

a multiplier arrangement receiving said first color mixture digital signals as first inputs and said digital coefficients from said storing means as second inputs to obtain a plurality of products in binary-coded form;

means for sequentially clocking out of said storing means to said multiplier arrangement different ones of said digital coefficients to obtain said plurality of products as a sequence of different first color constituents of said second color mixture digital signals; and

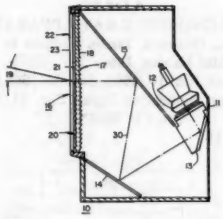
means for combining said plurality of products to obtain said second color mixture digital signals.

4,544,946

VERTICAL COLOR SHIFT CORRECTION IN A REAR PROJECTION TELEVISION SCREEN

Bertram VanBreemen, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1983, Ser. No. 487,383
Int. Cl.[4] H04N *9/31*
U.S. Cl. 358—60 **13 Claims**



1. In a rear projection television receiver incorporating a video image source and a rear projection screen comprising a field lens; a light directing prism lens comprising a plurality of horizontally disposed lens elements; and a focusing lens for focusing said directed light onto an image surface,

said video image source comprising a plurality of horizontally aligned monochrome kinescopes, each of said kinescopes producing an image on a faceplate wherein a plane normal to the faceplate and passing through the horizontal centerline of at least one of said kinescopes is displaced with respect to a plane normal to the faceplate and passing through the horizontal centerline of another of said plurality of kinescopes.

4,544,947

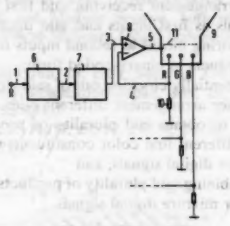
ADJUSTMENT-FREE DRIVE CIRCUIT FOR COLOR TELEVISION PICTURE TUBES

Wolfgang Haussman, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,497
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204744
Int. Cl.[4] H04N *9/20*
U.S. Cl. 358—65 **3 Claims**

1. Adjustment-free drive circuit for color television picture tubes, comprising an amplifier having a non-inverting input receiving an equalized signal of an individual color component red, green or blue as a reference value, an inverting input receiving a voltage proportional to the actual value of the cathode current, and an output, said reference value at the non-inverting input being compared in said amplifier with said actual value at said inverting input for issuing a signal at said

output of said amplifier having the smallest possible difference between said desired and actual values, said output of said



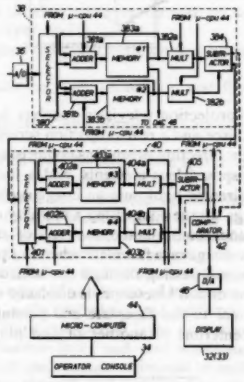
amplifier being connected to the control grid of a picture tube for applying said signal issued at said output thereto.

4,544,948

DIAGNOSTIC X-RAY APPARATUS

Kiyoshi Okazaki, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 10, 1983, Ser. No. 502,947
Claims priority, application Japan, Jun. 11, 1982, 57-99138
Int. Cl.[4] H04N *5/32*
U.S. Cl. 358—111 **4 Claims**



1. A diagnostic X-ray apparatus comprising:

means for producing first digital difference video signals of an object under observation when contrast medium is in a first state of distribution within that object;

means for producing second digital difference video signals of said object when said contrast medium is in a second state of distribution within that object;

means for weighting said first and second difference signals with first and second weighting factors, respectively, to produce first and second weighted digital difference video signals;

means for subtracting said first weighted difference video signals from said second weighted difference signals to produce third digital video signals of said object;

means for comparing said third video digital signals to a predetermined value; and

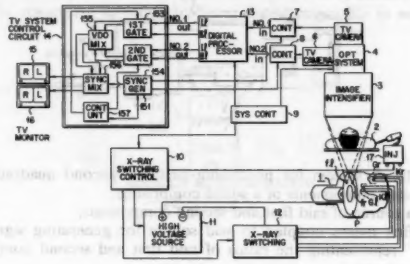
means for varying at least one of said weighting factors to reduce said third video signals to below said predetermined values.

4,544,949

X-RAY DIAGNOSTIC APPARATUS AND METHOD

Tetsuro Kurihara, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 4, 1983, Ser. No. 472,245
Claims priority, application Japan, Mar. 5, 1982, 57-34589
Int. Cl.[4] H04N *7/18*; A61B *6/02*
U.S. Cl. 358—111 **7 Claims**



1. A method for obtaining, on a TV monitor, a stereoscopic X-ray angiographic image of an object under X-ray examination where a contrast medium is injected into said object, comprising the steps of:

alternately projecting X-rays toward said object at first and second projection angles;

producing a first X-ray image of said object taken from said first angle before said contrast medium has been injected;

producing a second X-ray image of said object taken from said first angle after said contrast image has been injected;

producing a third X-ray image of said object taken from said second angle before said contrast medium has been injected;

producing a fourth X-ray image of said object taken from said second angle after said contrast medium has been injected;

generating first, second, third, and fourth analog video signals from said first, second, third, and fourth X-ray images, respectively;

producing a first subtraction image by performing a first digital subtraction between said first and second analog video signals;

producing a second subtraction image by performing a second digital subtraction between said third and fourth analog signals; and

combining said first and said second subtraction images within one frame period of said TV, whereby both said subtraction images are displayed on said TV monitor at the same instant so that a stereoscopic view of said object is displayed.

4,544,950

TECHNIQUE FOR THE TRANSMISSION OF VIDEO AND AUDIO SIGNALS OVER A DIGITAL TRANSMISSION SYSTEM

Peter J. Tu, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 3, 1984, Ser. No. 567,538
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—143 **12 Claims**

1. A transmitter capable of transmitting a video input signal and a plurality of audio input signals over an output channel, the transmitter comprising:

first converting means capable of converting samples of the video input signal and associated video processor mode status signals into a video output signal including representative S-bit digital words using a sampling rate which is a predetermined multiple of a subcarrier frequency of the video input signal;

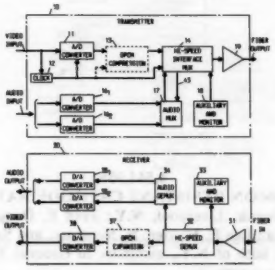
second converting means capable of converting each of the plurality of audio input signals into a separate representative digital output signal;

first multiplexing means capable of multiplexing the plurality of digital output signals from the second converting means into a digital output signal comprising a predetermined sequence of bits;

means capable of generating appropriate binary monitoring and supplementary data bits; and

second multiplexing means comprising

a first multiplexer capable of multiplexing the video output signal from the first converting means and the audio output signal from the first multiplexing means to generate a first output signal including sequential N-bit



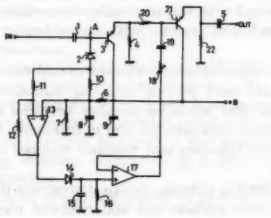
frames, each N-bit frame comprising alternating multiples of one or more audio bits and video processor mode status bits and each sequential multiple of the audio and video mode status bits is separated by a predetermined plurality of sequential video signal bits, and a second multiplexer capable of multiplexing the first output signal from the first multiplexer with the output signal from the monitoring and supplementary data bit generating means to generate an output signal comprising a signal format which includes alternating multiples of monitoring and supplementary data bits and sequential predetermined subframe portions of sequential N-bit frames forming the first output signal of the first multiplexer for transmission over the output channel.

4,544,951

VIDEO CLAMPING CIRCUIT

Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 12, 1983, Ser. No. 484,193
Claims priority, application Japan, Apr. 12, 1982, 57-60759
Int. Cl.[4] H04N *5/18, 5/16*
U.S. Cl. 358—172 **2 Claims**



1. In a video clamping circuit for receiving a video signal on which an energy dispersal signal is superimposed, which includes a clamping buffer circuit having a buffer amplifier having an input section and an output section, and a clamping diode connected to the input section of the buffer amplifier, the improvement comprising:

means for detecting the current flowing through the diode and producing a detection signal indicative of a variation in an input signal level at the input section of the buffer amplifier;

means for producing a cancellation signal from said detection signal; and

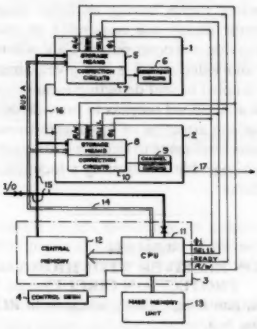
means for superimposing the cancellation signal on an output signal at the output section of the buffer amplifier in an anti-phase relation.

4,544,952

CORRECTION CONTROL DEVICE AND A SYSTEM FOR AUTOMATIC ESTABLISHMENT OF CORRECTION DATA FOR A TELEVISION CAMERA

Luc Pham van Cang, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 21, 1983, Ser. No. 487,017
Claims priority, application France, Apr. 23, 1982, 82 07065
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—210 **10 Claims**



1. A correction control device for a television camera connected to a camera channel equipment unit, wherein said device comprises a mass memory unit containing the camera connection data, a correction memory, a digital computer for transferring the correction data contained in the mass memory unit into the correction memory automatically as well as correction circuits which are responsive to the correction data contained in the correction memory in order to produce action on the adjustment circuits of said camera and/or of said channel equipment unit, wherein the correction memory is a random-access memory addressed by addressing means controlled by the computer and acting in synchronism with the camera target scan and wherein writing of data in the correction memory is carried out by the computer only at the beginning of the camera line scan.

4,544,953

AUTOMATIC FACUSING USING SLOPE AND PEAK DETECTION

David A. Goldman, Yorktown Heights, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

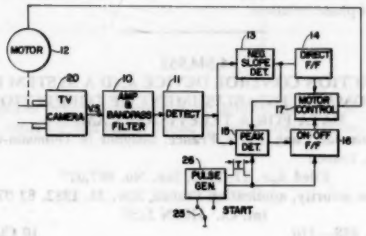
Filed Mar. 28, 1983, Ser. No. 479,457
Int. Cl.[4] H04N *5/26*
U.S. Cl. 358—227 **16 Claims**

1. An automatic focussing system responsive to a video signal of the type generated by a television camera to provide a focus adjustment for a focus assembly associated with a focusable apparatus comprising;

filter means responsive to said video signal for providing at an output a band-limited signal,

video detector means responsive to said band-limited signal to provide at an output a detected signal,

detecting means responsive to said detected signal, said detecting means including a peak detector having an input coupled to said video detector means and responsive to said detected signal to provide a first output when said detected signal has a maxiumum peak value and including



slope detecting means having an input coupled to said video detector means and responsive to said dectected signal to provide a second output only when the rate of change of said video signal is in a given direction, and

logic means coupled to said detecting means and responsive to said first and second outputs to provide control signals indicative of the direction of focus adjustment,

and drive means responsive to said control signals to provide a drive signal capable of adjusting a focus assembly to an optimum focus.

4,544,954

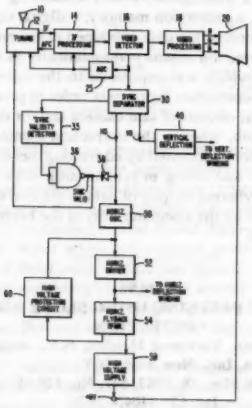
TELEVISION RECEIVER WITH HIGH VOLTAGE PROTECTION CIRCUIT

Keming J. Chen, San Diego, Calif., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 23, 1984, Ser. No. 573,229

Int. Cl.[4] H04N *5/68, 5/44;* **H03L** *7/00*

U.S. Cl. 358—243 **6 Claims**



1. In a system for processing a video signal including image and image synchronizing components, said system including an image display device for reproducing an image in response to said video signal; apparatus comprising:

means responsive to said video signal for providing an output signal including an image synchronizing component;

means responsive to said output signal from said providing means for controlling image reproduction by said display device;

detector means coupled to said providing means for producing at an output a first control signal when said output signal from said providing means corresponds to a normal synchronizing component, and a second control signal when said output signal from said providing means corresponds to an abnormal synchronizing component; and

means for inhibiting the response of said image reproducing control means to said output signal from said providing means when said second control signal is developed.

4,544,955

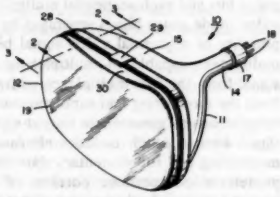
IMPLOSION RESISTANT CATHODE RAY TUBES

Harry R. Swank, Liverpool, N.Y.; Fred F. Doggett, Daytona Beach, Fla.; Lee E. Huyler, N. Syracuse, and Santo J. Sofia, Syracuse, both of N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Jan. 30, 1984, Ser. No. 575,137

Int. Cl.[4] H04N *5/65*

U.S. Cl. 358—246 **6 Claims**



1. A cathode ray tube comprising:

a funnel member having a neck portion and a flared portion;

a faceplate member having a viewing portion and a rearwardly extending skirt portion, said skirt portion being joined to said flared portion of said funnel member;

an adhesive member having a flexible, fiberous backing material with first and second layers of soft, flexible, cure resistant adhesive material on opposite sides thereof;

a rimband member overlaying the skirt portion of said faceplate member with one adhesive surface of said adhesive member in contact with and adhering to said rimband member and with the other adhesive surface of said adhesive member in contact with and adhering to said skirt portion;

means for applying tensile stresses to said rimband member about said skirt portion and said adhesive member to compress said adhesive member between said rimband member and said skirt portion to form soft, flexible adhesive bonds between said rimband member and said skirt portion;

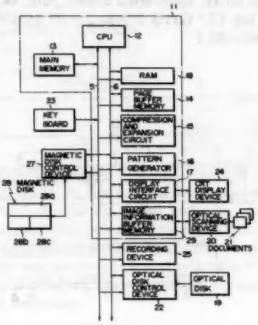
said soft, flexible adhesive bonds dampening the movement of said skirt portion and said rimband member at said adhesive surfaces which dampening of movement retards the speed of crack propagation in said tube and said fiberous backing material imparting lateral and longitudinal stability to said adhesive bond interfaces upon crack propagation.

4,544,956

IMAGE INFORMATION REGISTERING/RETRIEVING SYSTEM

Makoto Shimizu, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki, Kawasaki, Japan

Filed Mar. 26, 1984, Ser. No. 593,306
Claims priority, application Japan, Mar. 30, 1983, 58-54331
Int. Cl.⁴ H04N *1/27*
U.S. Cl. 358—296 **2 Claims**



1. An image information registering/retrieving system comprising:

a first information-storing medium on which a plurality of image information and a plurality of retrieving data for reproducing said image information are registered, each of said retrieving data being in correspondence with the corresponding image information;

a second information-storing medium on which said plurality of retrieving data is stored; and

means for controlling said first information-storing medium and said second information-storing medium in such a manner that said plurality of retrieving data registered on said first information-storing medium is copied onto another second information-storing medium when said second information-storing medium loses its function and is replaced by said another second information-storing medium.

4,544,957

TIME BASE CORRECTION APPARATUS

Mitsuro Moriya, Neyagawa, and Makoto Ichinose, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1982, Ser. No. 444,038
Claims priority, application Japan, Nov. 24, 1981, 56-188776; Mar. 29, 1982, 57-51741
Int. Cl.⁴ H04N *5/76*
U.S. Cl. 358—338 **6 Claims**

1. A time base correction apparatus comprising:

a disc-shaped recording medium having a signal track;

first drive means for rotatably driving said disc-shaped recording medium;

transducer means for reproducing signals recorded on said signal track of said recording medium;

second drive means for moving said transducer means from one scanning position to another relative to said recording medium in a reverse direction of said signal track of said recording medium, responsive to a first control signal applied thereto;

reference signal generating means for generating a reference signal;

first control means receiving said reference signal, for controlling said first drive means to rotate said recording medium in phase synchronism with said reference signal;

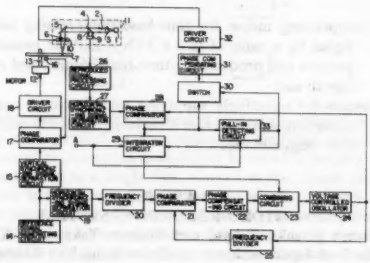
synchronizing signal detection means for separating a synchronizing signal from signals reproduced by said transducer means;

variable phase means receiving said reference signal and a second control signal, said variable phase means including fourth control means producing an output which is controllable in synchronism with said reference signal and which has a phase which varies in accordance with said second control signal;

phase comparison means for providing an output signal representing a phase difference comparison of a phase of said separated reproduced synchronizing signal with a phase of said output of said variable phase means;

third control means receiving said output signal of said phase comparison means and applying it to said second drive means through a switching circuit, said output signal being provided to said second drive means through said switching circuit comprising said first control signal;

an integrator circuit receiving a third control signal, said integrator circuit having a time constant which varies in accordance with said third control signal;



second control means providing an output signal of said integrator circuit to said variable phase means, said output signal of said integrator circuit comprising said second control signal;

detecting means receiving said output signal of said phase comparison means and for determining whether said output signal of said phase comparison means is within a predetermined range;

actuating means for actuating said switching circuit to pass said first control signal responsive to a said output signal from said detecting means indicating that said output signal of said phase comparison means is within said predetermined range; and

circuit means receiving said output signal from said detecting means and applying it to said integrator circuit to control said integrator circuit to have a predetermined small time constant when said output signal of said phase comparison means is not within said predetermined range and a predetermined large time constant when said output signal of said phase comparison means is within said predetermined range.

4,544,958

HIGH-SPEED RECORDING AND REPRODUCING OF SIGNALS

Kentaro Odaka, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

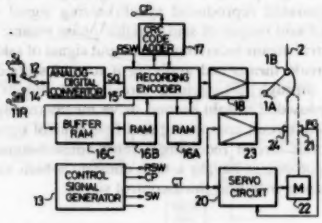
Filed Dec. 23, 1983, Ser. No. 564,890
Claims priority, application Japan, Dec. 27, 1982, 57-230599
Int. Cl.⁴ G11B *5/00*
U.S. Cl. 360—8 **17 Claims**

1. Apparatus for recording an analog signal on a magnetic medium using n rotating recording heads that periodically scan the magnetic medium in a plurality of discrete traces, n being a positive integer; said apparatus comprising:

converting means for converting said analog signal to a digital signal;

means for rotating said n rotating recording heads at a rotary speed equal to N times a reference rotation speed, where N is greater than one;

guide means for guiding said magnetic medium past said rotating recording heads over an angular range of $\alpha°$, where $\alpha°$ is less than 360°;



compressing means for time-base compressing said digital signal by a ratio of $(n\times\alpha°)/(N\times360°)$ at predetermined periods and producing a time-base compressed recording signal; and

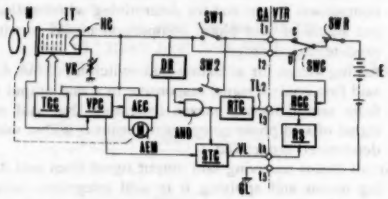
means for selectively supplying said time-base compressed recording signal to said n rotating heads for recording on said magnetic medium.

4,544,959

VIDEO RECORDING SYSTEM

Susumu Kozuki, Tokyo, and Makoto Takayama, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,211
Claims priority, application Japan, May 12, 1981, 56-71225
Int. Cl.⁴ H04N *5/782*
U.S. Cl. 360—33.1 **20 Claims**



1. A video recording system comprising in combination:

(A) image pick-up means for producing an electrical signal corresponding to a received object image, said pick-up means having a partially operative standby state for preparation of the production of said signal and a fully operative state at which the pick-up means produces the signal;

(B) recording means for recording the electrical signal produced from said image pick-up means on a recording medium, said recording means having a partially operative standby state for a preparation of the signal recording and a fully operative state at which the recording means records the signal on the medium;

(C) first instruction means for setting said image pick-up means and said recording means at their respective standby states;

(D) second instruction means for producing an instruction to set said image pick-up means and said recording means at their respective fully operative states; and

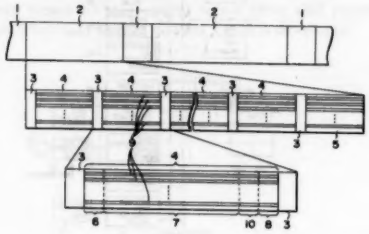
(E) control means for inhibiting the instruction of said second instruction means until said image pick-up means and said recording means reach their respective standby state.

4,544,960

ELECTRONIC STILL CAMERA

Masahiro Konishi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 13, 1982, Ser. No. 407,871
Claims priority, application Japan, Aug. 14, 1981, 56-127404
Int. Cl.⁴ G11B *27/00, 27/10;* **H04N** *5/782*
U.S. Cl. 360—35.1 **7 Claims**



1. An electronic still camera, comprising:

an optical system;

a photoelectric conversion unit including a sensor for converting an optical image from the optical system into electrical signals corresponding to image data;

a magnetic recording unit, operatively connected to the photoelectric conversion unit, having a multi-track magnetic head for simultaneously recording the image data from the photoelectric conversion unit on a plurality of tracks of a magnetic tape, the magnetic tape having a width and being preformatted with format signals of a frequency lower than an image data recording frequency, the format signals extending over the entire width of the magnetic tape and defining a plurality of record units of a fixed length, each record unit corresponding to one frame;

a magnetic reproducing circuit for detecting the format signals on the magnetic tape;

a controller, operatively connected to the magnetic recording unit and the magnetic reproducing unit, for controlling the recording of the image data in accordance with the format signals detected by the magnetic reproducing circuit; and

a magnetic tape drive unit, operatively connected to the controller, for driving the magnetic tape for recording and stopping the magnetic tape after recording.

4,544,961

TRIPLEX DIGITAL MAGNETIC RECORDING AND REPRODUCING SYSTEM

Chao S. Chi, Cupertino, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,387
Int. Cl.⁴ G11B *5/09, 5/02*
U.S. Cl. 360—40 **17 Claims**

1. A magnetic recording system for recording information on a magnetic medium, comprising:

means for generating a substantially continuous alternating signal,

means for applying said alternating signal to provide a multiplicity of magnetic flux reversals that substantially erases said magnetic medium,

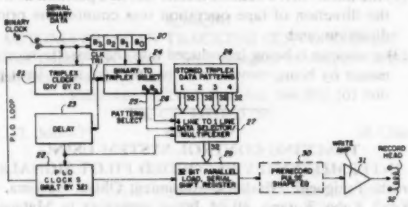
means for providing an interruption of said alternating signal at a controlled polarity and position thereof,

said interruption comprising a break of predetermined duration corresponding to said controlled polarity embedded in said alternating signal,

means coupled to said alternating signal for controlling the duration of said break by selecting at least two of a plurality of predetermined durations, and

means for receiving and recording said interrupted alternating signal on said medium,

said controlled polarity being defined by the direction of



said alternating signal at the time of initiating said interruption, and said alternating signal being resumed after said break in an opposing polarity defined by the direction of said alternating signal at the time of resumption, said time of initiating said interruption and said time of resumption bounding said break corresponding to one of said predetermined durations.

4,544,962

METHOD AND APPARATUS FOR PROCESSING BINARY DATA

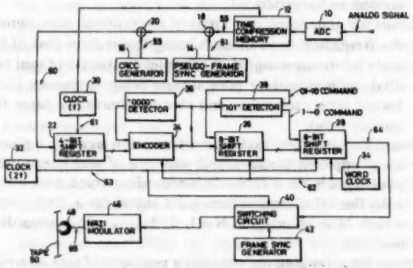
Misao Kato, Katano; Yasuharu Shimeki, Suita; Hiroshi Matsushima, Hirakata; Shiro Tsuji, Minoo; Nobuyoshi Kihara, Amagasaki, and Yoshinori Amano, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 2, 1982, Ser. No. 394,766

Claims priority, application Japan, Jul. 6, 1981, 56-105800; Mar. 10, 1982, 57-38483; Mar. 19, 1982, 57-45015; May 20, 1982, 57-85900

Int. Cl.[4] G11B 5/07

U.S. Cl. 360—40 **21 Claims**



1. A method of processing binary data, comprising the steps of:

dividing all of the binary data into 4-bit data segments;

converting all of the 4-bit data segments to 8-bit codes according to a predetermined encoding transfer function describing the relationships between said 4-bit data segments and corresponding 8-bit codes, wherein the bit pattern of each said 8-bit code has an intra-code run-length of at least two "0" bits and forms an inter-code run-length susceptible of extending from at least two "0" bits to at most nine "0" bits with an adjacent 8-bit code;

generating a frame synchronization code; and

serially combining said 8-bit codes and said frame synchronization code to form a frame of binary digits, and recording the binary digits of the frame in a magnetic recording medium, the recorded frame format inherently reliably maintaining frame synchronization while providing a relatively large value of minimum magnetic reversal time and a relatively small value of maximum magnetic reversal time.

4,544,963

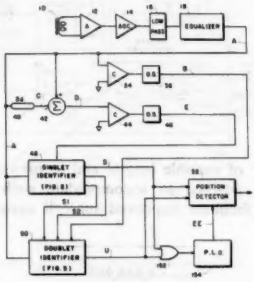
READ SIGNAL DETECTION IN TERNARY 3PM MAGNETIC RECORDING

George V. Jacoby, Los Altos, and Allan A. Schwartz, San Jose, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,392

Int. Cl.[4] G11B 5/09

U.S. Cl. 360—40 **19 Claims**



1. Circuitry responsive to a detected analog read signal for identifying each symbol in a sequence of recorded signals coded in a ternary-3-position modulation in which a ternary 1 symbol is recorded as a single flux reversal at the center of a timing detent and is read as a singlet analog signal, a ternary 2 symbol recorded as two flux reversals within the boundaries of a detent is read as a sinusoidal shaped doublet analog signal, and a ternary 0 symbol is recorded and read as the absence of flux change in a detent, said circuitry including:

receiving means for detecting the read signals of the recorded ternary code and for producing therefrom equalized analog signals containing ternary-3-position modulation symbols;

doublet and singlet position locator circuitry coupled to said receiving means and responsive to said equalized analog signals for detecting the location of the center of each detent identified with a doublet and singlet and for producing a doublet position locator signal and a singlet position locator signal indicative thereof;

singlet identifier circuitry coupled to said receiving means and to said singlet position locator circuitry for identifying each singlet by its amplitude, for correctly timing each identified singlet with said singlet position locator signal, and for generating output signals indicative of said timed singlet and its positive and negative sign; and

doublet identifier circuitry coupled to said receiving means, said doublet position locator circuitry, and to said singlet identifier circuitry, said doublet identifier circuitry including control signal producing means responsive to positive and negative sign signals from said singlet identifier for producing a control signal of first and second signs, said doublet identifier circuitry further including gating circuitry responsive to positive and negative excursions of said equalized analog signals and to said control signal for producing timed output pulses indicative of those doublets in said equalized analog signal that have a slope at the center of their respective detent that corresponds in sign to the sign of the previous singlet.

4,544,964

STROBE FOR READ/WRITE CHAIN

Kenneth R. Burns, and Robert L. Hazel, both of Winnipeg, Canada, assignors to Burroughs Corporation, Detroit, Mich.

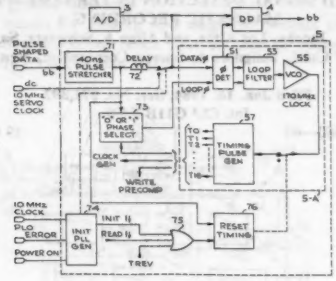
Continuation of Ser. No. 83,411, Oct. 10, 1979, , which is a continuation of Ser. No. 880,721, Feb. 24, 1978,. This application Nov. 17, 1980, Ser. No. 207,311

Int. Cl.[4] G11B 5/09

U.S. Cl. 360—51 **30 Claims**

1. In a magnetic recording system including a prescribed

read/write arrangement involving digital data signals, the combination therewith of an improved strobe means adapted to generate a selectable number of timing pulses as a "strobe chain" and to adjustably and uniformly distribute them across



a "data cell" of variable length, and to provide timing-sampling means adapted to accommodate such "data cells", whereby to facilitate improved sub-cell sampling and data detection.

4,544,965

AUTOMATIC PREFERRED DIRECTION SELECTION FOR A BIDIRECTIONAL TAPE TRANSPORT

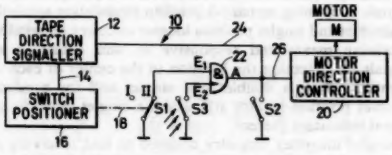
Tilo Diepholz; Walter Hapke, both of Hildesheim; Wilhelm Wöhl, and H.-Joachim Schindler, both of Giesen, all of Fed. Rep. of Germany, assignors to Blaupunkt Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 489,822

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216452

Int. Cl.[4] G11B *15/44*

U.S. Cl. 360—71 **8 Claims**



1. Bidirectional tape transport apparatus having

a tape drive means (M, 20) including a motor direction control means (20) controlling the direction of operation of tape being transported in the apparatus;

a tape direction signalling means (12, S1) coupled to the tape drive means and providing a tape direction output signal (14) representative of the direction of transport of the tape in the apparatus;

cassette receiving means (32, 34) to receive a tape cassette (30) and, selectively, position said tape cassette in

(a) a transducing position, in which the cassette is entirely retained in the receiving means; and

(b) a park position in which the cassette is moved away from the transducing position, but retained with the receiving means; and

the cassette receiving means permitting

(c) placing the cassette in a removed position in which the cassette is removed from the receiving means,

said apparatus comprising, in accordance with the invention,

a direction priority switch (S3) operatively associated with the cassette receiving means (32, 34) and sensing the location of the cassette in the respective positions (a), (b), or (c); and

logic means (22; 50, 22') including an AND-gate (22, 22') coupled to the direction priority switch (S3) and the tape direction signalling means (S1), connected to and providing a direction control signal to the motor direction control means (20) and controlling reversal of direction of operation of said tape drive means under the logic conditions;

(1) the cassette receiving means is empty, so that the cassette is in position (c);

(2) the motor drive control means was in a position in which the direction of tape operation was counter the priority direction; and

(3) a cassette is being introduced into the cassette receiving means by being moved from position (c) to at least position (b).

4,544,966

TRACKING CONTROL SYSTEM USING INTERMITTENTLY RECORDED PILOT SIGNALS

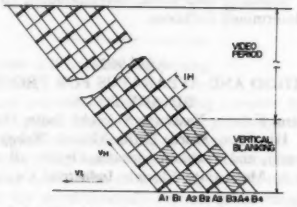
Hiroshi Taniguchi, Hirakata; Masamitsu Ohtsu, Kadoma, and Kanji Kubo, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 10, 1981, Ser. No. 301,097

Claims priority, application Japan, Sep. 17, 1980, 55-129727

Int. Cl.[4] G11B *21/10, 21/02*

U.S. Cl. 360—75 **13 Claims**



1. A tracking control pilot signal recording and reproducing system for controlling a position of a reproducing means relative to the tracks of a moving recorded medium which it reproduces, comprising:

means for supplying a main information signal to be recorded and reproduced;

means for generating two kinds of intermittent pilot signals, the frequency band of each being lower than that of the main information signal, the frequency spectra of said two kinds of intermittent pilot signals being frequency interleaved with each other and sharing almost the same frequency band;

means for recording said main information signal in a plurality of adjacent tracks mixed with one of said intermittent pilot signals on a (2N−1)th recording track and mixed with the other intermittent pilot signal on a 2Nth track, where N is an integer, N=1, 2, 3, . . . , on a recording medium;

means for arranging the recording positions of said intermittent pilot signals on the (2N−1)th track and (2N+1)th track, so they do not align in a direction transverse to the recorded tracks, and for arranging the recording positions of said intermittent pilot signals on the 2Nth track and (2N+2)th track so they do not align in a direction transverse to the recorded tracks;

means for reproducing said recorded signal;

means for separating reproduced pilot signals from the resulting reproduced signal;

means for separating from said reproduced pilot signals, the pilot signal of a main reproduced track and the pilot signals of front and rear adjacent tracks by using a comb filter;

gating means for separating the pilot signal of the front adjacent track from the pilot signal of the rear adjacent track, said gating means being responsive to gate pulses produced from the pilot signal timing of said main reproduced track;

means for comparing the level of the separated pilot signals of said front adjacent track and rear adjacent track; and

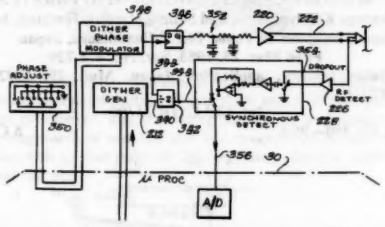
means for controlling the position of said reproducing means relative to the tracks of said recording medium using a signal derived from the comparison of the levels of said front and rear adjacent track pilot signals.

4,544,967

AUTOMATIC SCAN TRACKING SERVO SYSTEM

Kenneth Louth, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,961
Int. Cl.⁴ G11B 5/56
U.S. Cl. 360—77 **26 Claims**



1. In a magnetic tape recording and/or reproducing apparatus of the type which has a tape guide drum around which tape is wrapped, at least one rotatable transducing head mounted to an element that is movable along a path generally transverse to the longitudinal orientation of tracks of video information recorded on the tape, a servo system for controlling the movement of the element to accurately follow a track during reproducing and to selectively reposition the element to reproduce a desired track subsequently upon completion of the reproducing of a track, said system comprising:

drive means for controlling the movement of the element along said path;

means operatively connected to said drive means for causing the same to impart oscillatory dither movement to the element;

means for receiving a video signal reproduced by the reproducing head and for detecting the amplitude of a component of the reproduced signal related to the oscillatory movement;

a microprocessor; and

means for generating interrupt pulses to cause said microprocessor to sample the detected amplitude component at a predetermined number of locations relative to each track and to generate error correcting signals in response to the samples for application to said drive means, said microprocessor controlling the phase of the oscillatory movement causing means to thereby synchronize the sampling and the oscillatory movement to one another.

16. In a tape recording and reproducing apparatus of the type having a rotatable magnetic head for reproducing information signals recorded on the tape in tracks during rotation thereof, an automatic scan tracking servo system for providing accurate alignment of the head along a track of information being reproduced, comprising:

means for moving the head in a direction transversely of the track;

means for generating an oscillatory dither signal and for applying said signal to said moving means to cause said head to oscillate relative to the track;

a synchronous detector for detecting a component of the signal reproduced by the head;

a microprocessor for sampling the detected component and controlling said moving means in response to the sampled components; and

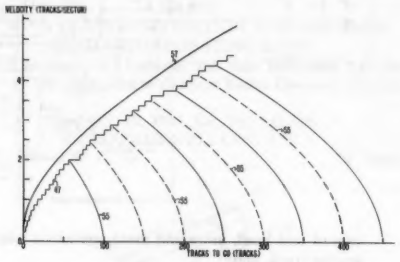
means responsive to the rotation of the head for presenting interrupt pulses to said microprocessor to sample said detected component at predetermined times related to the rotation of the head.

4,544,968

SECTOR SERVO SEEK CONTROL

Todd B. Anderson; Thomas W. Glaser, and John J. Neesz, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1982, Ser. No. 378,966
Int. Cl.⁴ G11B 5/55
U.S. Cl. 360—78 **5 Claims**



1. In a data storage device wherein information is retained on tracks formed of sectors containing servo data that defines sequences of track types that form a capture area and are accessed by a transducer assembly driven by an electromagnetic actuator, position control means for moving said transducer assembly from one track location to another track location during a seek operation comprising:

a first continuous sequence of selected velocity values adjacent to, but continuously less than a second sequence of the highest velocity values with respect to which maximum deceleration will permit the selected terminal track position to be approached without overshooting;

drive means for applying forward direction drive, reverse direction drive or no drive to said transducer assembly;

acceleration means for applying said drive forward direction drive until a velocity is achieved approaching the value of said first sequence of velocity values; and

deceleration control means for effecting deceleration by using said drive means to induce said transducer assembly to follow said first sequence of velocity values without exceeding said second sequence of velocity values;

said deceleration control means including a continuous range of velocity values adjacent to and including said first sequence of velocity values, but less than said second sequence of velocity values, during which said drive means applies no drive to said transducer assembly whereby a dead band occurs wherein said transducer assembly is allowed to coast.

4,544,969

SERVOMECHANISM FOR DISC PLAYER

Richard C. Painton, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,893
Int. Cl.⁴ G11B 5/54, 5/58
U.S. Cl. 360—78 **15 Claims**

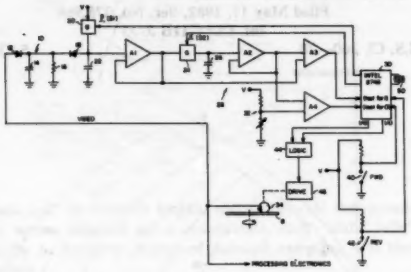
1. A static servo for use in positioning a playback head from a first generally circular track of a rotatable record disc having a plurality of generally circular tracks thereon to a second such track thereof comprising

(a) means for receiving the output signal of said head and for producing in response thereto a signal corresponding to the amplitude of said output signal,

(b) means for producing a reference threshold signal,

(c) means for receiving and comparing said amplitude and threshold signals for

1. positioning said head in a given direction toward said second track when said amplitude signal is greater than said threshold signal, thereby to cause said amplitude signal gradually to become smaller than said threshold signal as said head moves from said first track, and
2. positioning said head in said given direction after said amplitude signal becomes smaller than said threshold signal, thereby to cause said amplitude signal again to become greater than said threshold signal as the position of said head, more and more, coincides with said second track, and



(d) means for detecting when said amplitude signal attains a certain level and, in response thereto, interrupting the positioning of said head, thereby to effect playback of said second track by means of said head.

4,544,970

ADAPTER FOR A MINIATURE TYPE TAPE CASSETTE

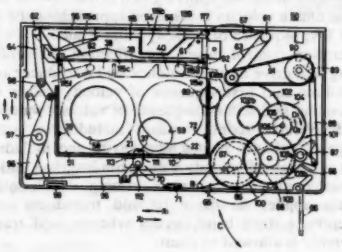
Haruki Ogata, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 9, 1983, Ser. No. 473,854

Claims priority, application Japan, Mar. 16, 1982, 57-35921[U]

Int. Cl.⁴ G11B *15/66*

U.S. Cl. 360—94 **10 Claims**



1. An adapter for a miniature type tape cassette having an external form and size smaller than those of a standard type tape cassette, said miniature type tape cassette being used with a recording and/or reproducing apparatus of a type different from a standard type recording and/or reproducing apparatus primarily designed for performing recording and/or reproduction with said standard type tape cassette, said miniature type tape cassette comprising a cassette case smaller than said standard type tape cassette, a tape accommodated within said cassette case and forming a tape path along a front of said cassette case when said miniature type tape cassette is not used, and a lid provided at the front of said cassette case in a state free to open and close, and covering the tape forming said tape path in front of said cassette case in its closed state, said lid being open in a state where said miniature type tape cassette is accommodated within said adapter, said adapter comprising:

an adapter case having an external form and size substantially identical to those of said standard type tape cassette;

an accommodating part for accommodating said miniature type tape cassette;

tape draw-out means provided within said adapter case, for drawing out the tape from said miniature type tape cassette so as to form a predetermined tape path within said adapter case; and

lid stopping means for stopping a lower surface of said open lid of said miniature type tape cassette accommodated within said accommodating part, at least at a substantially central part along a longitudinal direction of said lid.

4,544,971

MEMORY CASSETTE HOLDING APPARATUS

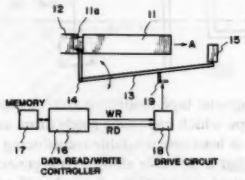
Hidetsugu Komiya, Hino, and Seiichi Hattori, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Mar. 25, 1983, Ser. No. 478,729

Claims priority, application Japan, Mar. 29, 1982, 57-44267[U]

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—96.5 **6 Claims**



1. An apparatus having a holder for holding a memory cassette so that data may be written into or read from the memory cassette, comprising:

(a) ejecting means for ejecting the memory cassette, the ejecting means having a rotatable lever and a rack coupled to the lever for being displaced thereby when said lever is rotated, said rack being adapted to eject the memory cassette from the holder when displaced in a prescribed direction by rotation of said lever, and

(b) locking means for selectively locking the ejecting means, the locking means having a magnet coil, an armature displaced by excitation of the magnet coil and a locking rod mechanically coupled to the armature for being moved thereby, said magnet coil being excited while data is being written into the memory cassette or read from the memory cassette, whereby said locking rod is moved by said armature to lock said lever against rotation, thereby preventing said ejecting means from ejecting the memory cassette before the writing of data into the memory cassette or the reading of data from the memory cassette has been completed.

4,544,972

SWINGING ACTUATORS FOR USE IN MAGNETIC DISC TYPE MEMORY DEVICES

Kenji Kogure, Sekimachi; Takao Kakizaki, Tokorozawa; Yasunaga Mitsuya, Sekimachi; Shigemitsu Oguchi, and Koji Otani, both of Tokorozawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 400,148

Claims priority, application Japan, Jul. 30, 1981, 56-119905

Int. Cl.⁴ G11B *5/54, 21/08, 5/55*

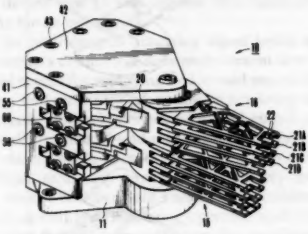
U.S. Cl. 360—105 **9 Claims**

1. A swinging actuator for use in a magnetic memory device comprising:

a stationary shaft;

at least two driving assemblies juxtaposed on said stationary shaft and extending in the opposite directions on both sides of said shaft;

each driving assembly including a head arm, a magnetic head mounted on one end of said head arm, a flat coil having a plane perpendicular to the axis of said shaft, a coil supporting member supporting said coil and extending on one side of said shaft opposite to said head arm; and



first and second flat permanent magnets spaced from said coil in an axial direction of said shaft, said first and second flat permanent magnets being spaced in a direction of arrangement of said flat coil and magnetized in said axial direction so that poles of the opposite polarities confront said flat coil.

4,544,973

SWING-ARM ARRANGEMENT FOR A MAGNETIC DISC STORAGE APPARATUS

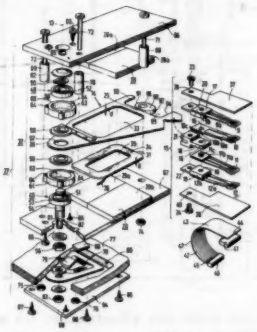
Oelke Van De Bult, The Hague, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 305,299, Sep. 24, 1981,. This application Sep. 27, 1983, Ser. No. 536,228

Claims priority, application Netherlands, May 22, 1981, 8102523

Int. Cl.[4] G11B *21/08, 5/55, 5/012*

U.S. Cl. 360—106 **7 Claims**



1. A swing arm arrangement for moving and positioning a magnetic head over a surface of a rigid rotatable magnetic disc of an apparatus for the storage and reproduction of digital data, which arrangement comprises:

a swing arm pivotal about an axis and having an end remote from the pivotal axis;

a flat control coil connected to the swing arm;

a permanent magnetic stator including

a stator frame,

a plurality of flat, axially magnetized permanent stator magnets connected to the stator frame, the magnets forming an air gap for the control coil and being arranged such that the coil is movable in an axial permanent magnetic field within the air gap formed between the permanent stator magnets, the stator frame including

a pair of iron stator end plates substantially defining two outer sides of the permanent magnetic stator, the plates extending over the control coil and the stator magnets, the magnets being mounted on the plates; and

a bearing arrangement, associated with the swing arm, for pivotally journalling the swing arm, the bearing arrangement comprising two ball bearings each having an inner race, the bearing arrangement further comprising a pivotal bearing pin coaxial with the pivotal axis, the swing arm and the inner races of the ball bearings being mounted on the bearing pin,

characterized in that the swing arm is arranged between the two ball bearings, and each of the stator plates extends transversely of the pivotal axis, intersects the axis and further extends in a direction generally toward the remote end of the swing arm, each plate carrying one ball bearing.

4,544,974

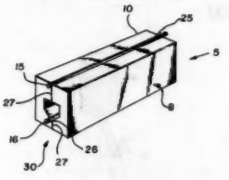
ALUMINA GLASS COMPOSITION AND MAGNETIC HEAD INCORPORATING SAME

Bradford D. West, Jr., LaMesa, and Jean Berchtold, LaJolla, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 20, 1983, Ser. No. 543,678

Int. Cl.[4] G11B *5/251;* **C03C** *3/16*

U.S. Cl. 360—120 **11 Claims**



1. In a glass composition suitable for bonding to metal alloys or metal oxides, the composition comprising an oxide of an alkali metal or alkaline earth, and at least one *metal oxide of a* non-alkali metal [oxide] in an amount sufficient to provide a coefficient of thermal expansion to said composition that is from about 80 to about $170\times10^{-7}\,C^{-1}$;

the improvement wherein

a) from about 5 to about 15 mole % of said composition comprises an oxide of aluminum; and

b) said composition further includes *about 10 to about 35 mole %* [a sufficient amount] of a compatible glass former for said oxide of aluminum [as] to render said oxide of aluminum soluble in said composition.

4,544,975

PAD ASSEMBLY FOR TAPE CASSETTE

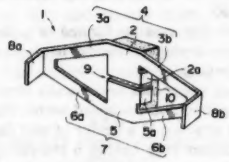
Kengo Oishi, and Masayoshi Moriwaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 4, 1983, Ser. No. 472,129

Claims priority, application Japan, Apr. 9, 1982, 57-59887[U]; Apr. 9, 1982, 57-52362

Int. Cl.[4] G11B *15/60*

U.S. Cl. 360—130.33 **2 Claims**



1. A pad assembly for a magnetic recording tape cassette wherein a tape pad is supported on a resilient pad supporting member, said pad supportiong member comprising an upper half having an upper pad supporting portion and first and second arm portions extending from either side of the upper part of the upper pad supporting portion, and a lower half

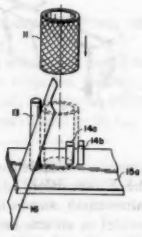
having a lower pad supporting portion and first and second arm portions extending from either side of the lower part of the lower pad supporting portion, said first arm portions converging and being connected to each other and said second arm portions converging and being connected to each other, and said upper pad supporting portion and said lower pad supporting portion being separated from each other by a slit; and said tape pad being connected to both the upper pad supporting portion and the lower pad supporting portion.

4,544,976

PAD PROVIDED IN THE INTERIOR OF A VIDEOTAPE CASSETTE

Kengo Oishi; Choji Komiyama, and Osamu Suzuki, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 6, 1982, Ser. No. 447,300
Claims priority, application Japan, Dec. 15, 1981, 56-186963[U]
Int. Cl.⁴ G11B *15/60*
U.S. Cl. 360—132 **6 Claims**



1. A videotape cassette comprising two halves, one of which is equipped with an upright guide stud and two opposing upright mount studs, and a hollow cylindrical pad of a resilient or flexible material, said pad being fitted in between the guide stud and the mount studs with the lower wall of the hollow cylinder inserted in between and retained by the opposing mount studs, the pad being adapted to yieldingly deform and resiliently push a videotape against the guide stud.

4,544,977

MAGNETIC DISC DEVICE

Kazuo Ozawa, and Tetsuo Sawa, both of Tagajo, Japan, assignors to Sony Corporation, Japan

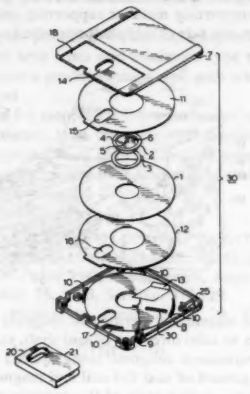
Filed Aug. 30, 1982, Ser. No. 413,228
Claims priority, application Japan, Aug. 31, 1981, 56-129064
Int. Cl.⁴ G11B *23/02, 5/016;* B65D *85/30*
U.S. Cl. 360—133 **5 Claims**

1. A magnetic disc cassette formed of a flexible magnetic disc received on a driving mechanism having a shaft associated therewith, comprising:

a cover having upper and lower walls closely spaced to a flexible magnetic disc contained within the cover;

a center core attached at a center of said flexible magnetic disc, said center core having a central aperture with a corresponding aperture in the lower wall of said disc cassette positioned for access to said magnetic disc center core;

said shaft being positioned through the aperture of said lower wall of the cassette and through the central aperture of said center core, and an end of said shaft abutting against an inner surface of the upper wall of the cassette when the cassette is in an operating position on the driving mechanism; and



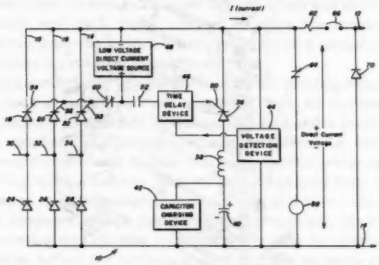
an anti-wearing member attached at a portion of the inner surface thereof where said end of said shaft is brought in contact therewith.

4,544,978

CIRCUIT FOR THE ARCLESS DE-ENERGIZATION OF A DIRECT CURRENT LOAD

David J. Podobinski, Washington, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Mar. 30, 1984, Ser. No. 595,505
Int. Cl.⁴ H02H *3/087*
U.S. Cl. 361—4 **20 Claims**



1. A circuit for the arcless de-energization of a direct current load receiving direct current from a rectified alternating current source comprising,

means for rectifying alternating current from an alternating current source to provide therefrom direct current to said direct current load, said means for rectifying having a current flow controller connected with each phase of said alternating current source and said means for rectifying being operably connected in said circuit with said direct current load,

means for de-energizing the then conducting current flow controller in said means for rectifying, said means for de-energizing having a current flow controller and being operably connected in said circuit with said means for rectifying between said means for rectifying and said direct current load,

a voltage detection device for detecting a predetermined voltage drop in said circuit, said voltage detection device

being operably connected in said circuit between said means for rectifying and said direct current load,

a time delay device for regulating the activation of said means for de-energizing, said time delay device being operably connected in said circuit to said voltage detection device and to said current flow controller in said means for de-energizing,

means for providing an actuating signal being operable to activate to a conductive state each current flow controller in said means for rectifying and in said means for de-energizing, said means for providing an actuating signal being selectively operably connected in said circuit to said time delay device and to said means for rectifying, and

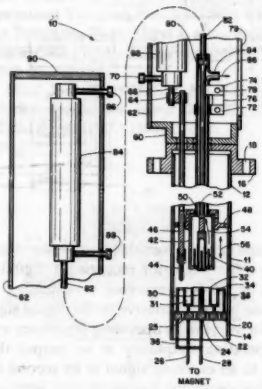
a relay device being operable to respond to a direct current overload, said relay device being operably connected in said circuit between said means for rectifying and said direct current load and being operable to disconnect said actuating signal from said means for rectifying and connect said actuating signal to said means for de-energizing.

4,544,979

AUTOMATIC CURRENT LEAD RETRACTOR SYSTEM FOR SUPERCONDUCTING MAGNETS

Robert M. Ennis, Jr.; D. Michael Coffey, both of Oak Ridge, and R. Wayne McGhee, Jacksboro, all of Tenn., assignors to Cryomagnetics, Inc., Oak Ridge, Tenn.

Filed Mar. 22, 1984, Ser. No. 592,342
Int. Cl.[4] H01F *7/22*
U.S. Cl. 361—19 **12 Claims**



1. A system for automatically and safely retracting current leads feeding current to a superconductor magnet operating in an environment at a selected temperature and in a persistent mode, which comprises:

an elongated hollow thimble unit for being immersed in such environment of such magnet, said thimble unit being fabricated of a material of low thermal conductivity and having a first end maintained at substantially such selected temperature, and a further end;

a first pair of magnet current contacts mounted within said first end of said thimble unit, each contact of said pair connected to a separate electrical lead to such magnet;

a further pair of magnet current contacts within said thimble each proportioned to engage respective of said first pair of magnet current contacts, said second pair of magnet current contacts adapted for axial movement along said thimble from a position of contact with said first pair to a position removed from such environment of such magnet;

a first fluid operated means connected to said further pair of magnet current contacts to effect said axial movement;

means for delivering electrical current to said further pair of magnet current contacts;

means for sensing such persistent mode of such magnet; and

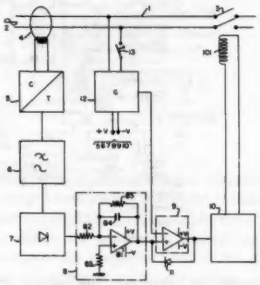
means for initiating operation of said fluid operating means when said persistent mode is sensed to separate said further pair of magnet current contacts from said first pair and remove said further pair from such environment.

4,544,980

DOMESTIC POWER LINE BREAKER

Gerard J. J. Serrie, Reims, and Jean-Marie Huvet, Rilly la Montagne, both of France, assignors to Claude, S.A., Puteaux, France

Filed Jan. 14, 1983, Ser. No. 458,111
Claims priority, application France, Jan. 18, 1982, 82 00654
Int. Cl.[4] H02H *3/33*
U.S. Cl. 361—45 **3 Claims**



1. A domestic power line breaker including a relay with contacts, in series with both conductors of the power line between the load and the a.c. power supply, said contacts being open when the control coil of said relay is not energized, the input signal of said breaker being delivered by the secondary windings of a differential transformer detecting any differential current in said line and being located on said power line between said contacts and said a.c. supply, said breaker being characterized in that it includes a current-to-voltage converter (5), a low pass filter (6), a rectifier (7), a function generator (8), a comparator (9) and an amplifier (10), said input signal being applied to said current-to-voltage converter (5), the output of which is connected to said low-pass filter (6) in series connection with said rectifier (7) the output of which is connected to said function generator (8) generating a voltage signal which is applied to the first input of said comparator (9) having a second input to which is applied a predetermined d.c. threshold voltage, the output signal of said comparator (9) being applied to the input of said amplifier (10) controlling the state of said relay contacts (3), the circuits of said breaker being supplied by a d.c. voltage source (12) connected to said power line (1) between said relay (3) and said a.c. power supply (2) through a restrike switch (13), said breaker further including a diode (11) that shunts said first input and said output of said comparator (9), in order to lock the relay contacts (3) in an open state if said breaker has controlled their opening.

4,544,981

SHORT CIRCUIT PROTECTOR/CONTROLLER CIRCUIT

Hakop M. Hakooplan, Huntington, N.Y., assignor to Harris Corporation, Melbourne, Fla.

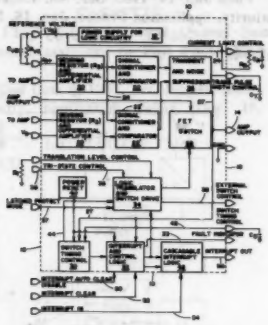
Filed Oct. 1, 1984, Ser. No. 656,510
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—93 **9 Claims**

1. A short circuit protector/controller circuit for an amplifier driving an electrical load, with the protector/controller

circuit being external to the internal circuit of the amplifier, comprising:

a. a positive voltage supply for the amplifier, coupled through a positive current sensing resistor placed in series with the positive power supply input line to the amplifier, such that the voltage across the positive current sensing resistor can be monitored independently for an overload condition;

b. a negative voltage supply for the amplifier, coupled through a negative current sensing resistor placed in series with the negative power supply input line to the amplifier, such that the voltage across the negative current sensing resistor can be monitored independently for an overload condition;



c. first means for comparing the voltage across said positive current sensing resistor with a reference threshold voltage which represents an overload circuit condition;

d. second means for comparing the voltage across said negative current sensing resistor with a reference threshold voltage which represents an overload circuit condition; and

e. means, responsive to the outputs of said first and second comparing means, for disconnecting the amplifier from its electrical load when the voltage across either of the positive or negative current supply resistors exceeds its reference threshold voltage.

4,544,982

ELECTRICAL EQUIPMENT PROTECTION APPARATUS AND METHOD

David R. Boothman, Ennismore, and John C. Forde, Peterborough, both of Canada, assignors to General Electric Company, Salem, Va.

Filed Apr. 25, 1983, Ser. No. 487,771

Claims priority, application Canada, May 7, 1982, 402459

Int. Cl.[4] H02H *7/085*

U.S. Cl. 361—96 **1 Claim**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 67 Pages)

1. Apparatus for protecting a three phase electrical equipment by interrupting the supply of power to said equipment in response to a determination of an unacceptable condition comprising:

(a) sensor means for each phase for sensing the current in a respective phase of the supply of power to said equipment and for providing, for each phase, an analog signal representing current in the respective phase;

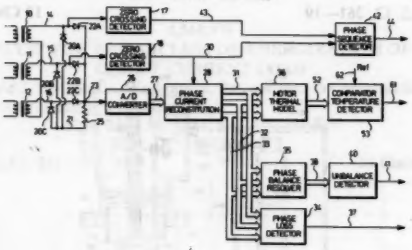
(b) rectifier means connected to said sensor means for receiving the analog signals, said rectifier means having a common output across which there is provided a composite analog signal representing a composite of the current for each phase;

(c) an analog-to-digital converter connected to said common output for receiving said composite analog signal and for providing a composite digital signal representing said composite analog signal;

(d) a first detector connected to a first one of said sensor means for receiving an analog signal representing current in a respective phase of said supply and for providing a first time signal representing the time at which the current in the respective phase of said supply passes through a reference level;

(e) a phase current reconstitution means connected to said analog-to-digital converter and to said first detector for receiving respectively said digital signal representing said composite analog signal and said first time signal and for providing, for each phase a digital signal representing the current values in the respective phase, said first time signal providing identification of said phase in normal sequence;

a motor thermal model means connected to said phase current reconstitution means for receiving therefrom three digital signals representing the current in each phase, said motor thermal model means including selecting means for selecting the one of said three digital signals representing the largest current, said motor thermal model means determining from the said one of the three digital signals and from the duration thereof an equivalent motor temperature and providing a temperature signal representing said equivalent motor temperature, said thermal model comprising:



(1) first and second variable frequency oscillators each having a first input for receiving a digital signal and a second input for receiving an enabling signal, each oscillator being responsive to the digital signal at its first input for varying its operating frequency and providing said operating frequency at an output thereof in response to an enabling signal at its second input,

(2) said first oscillator having its first input connected to receive said selected one of said three digital signals representing the largest current,

(3) a counter having a count up input and a count down input, the count up input being connected to said first oscillator and said count down input being connected to said second oscillator for receiving respective signals representing said respective operating frequencies, the output of said counter representing said equivalent motor temperature and,

(4) signal generating means alternately providing enable signals to said second inputs of said first and second oscillators;

(g) a temperature detector connected to said motor thermal model for receiving said temperature signal and comparing said temperature signal with a reference, said temperature detector providing an overtemperature tripping signal when said temperature signal exceeds said reference; and,

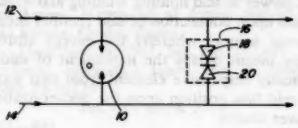
(h) means responsive to said over-temperature tripping signal for interrupting the supply of power to said equipment.

4,544,983

OVERVOLTAGE PROTECTION DEVICE

James E. Anderson; Michael J. Coleman, both of Ontario, and Frederick C. Livermore, Stittsville, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 28, 1983, Ser. No. 489,336
Int. Cl.[4] H02H 9/06
U.S. Cl. 361—119 5 Claims



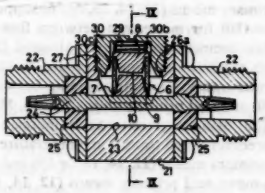
1. An overvoltage protection device, for telephone lines and other communications channels, comprising a primary protector and a secondary protector connected in parallel, the primary protector having in normal operation a first breakdown voltage, the secondary protector comprising a semiconductor pn junction having in normal operation a breakdown voltage greater than said first breakdown voltage and a current-carrying capacity significantly less than the current the pn junction would be required to carry once its aforesaid breakage voltage was exceeded, whereby the pn junction will fail short-circuit following its operation.

4,544,984

COAXIAL LIGHTNING ARRESTING STRUCTURE

Norihide Kawanami; Yukinori Miyake; Kenji Kawamura, all of Tokyo, and Toshiharu Toda, Mitaka, all of Japan, assignors to Hirose Electric Co., Ltd., Tokyo and Mito Teck Co., Ltd., Ibaragi, both of, Japan

Filed Jun. 20, 1983, Ser. No. 505,853
Claims priority, application Japan, Jun. 23, 1982, 57-107780
Int. Cl.[4] H02H 3/22
U.S. Cl. 361—119 5 Claims



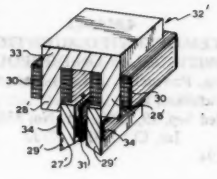
1. A coaxial lightning arresting structure comprising an inner conductor, an outer conductor surrounding the inner conductor and an arrester tube located between portions of the inner and outer conductors perpendicularly to the direction of transmission and connected at its ends to the inner and outer conductors, respectively, the portion of said outer conductor provided with the arrester tube having an equivalently substantially increased inner diameter as compared with the other portions of the outer conductor so that the ratio of the inner diameter of said outer conductor portion having said increased inner diameter to the inner conductor outer diameter is greater than the ratio of the outer conductor inner diameter at the other portions thereof to the inner conductor outer diameter, which latter ratio provides the coaxial transmission line with a given characteristic impedance, said outer conductor portion having the equivalently substantially increased inner diameter also being provided with a through-hole which is relatively large with respect to the arrester tube, for insertion of the arrester tube into the lightning arresting structure such that the through-hole surrounds the inserted arrester tube, and a cylindrical cap member being fitted in said arrester tube insertion hole formed in the outer conductor portion, said cap member being formed with a hole opening toward the inner conductor for accommodating a portion of the arrester tube in said cap member in relatively close-fitting relationship.

4,544,985

LIFTING ELECTROMAGNET

Rudi Metz, Donzdorf, and Herbert Scholl, Göppingen, both of Fed. Rep. of Germany, assignors to EMAG Maschinenfabrik GmbH, Salach, Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,401
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212465
Int. Cl.[4] H01F 7/08
U.S. Cl. 361—144 26 Claims



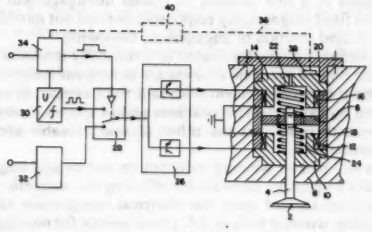
1. A lifting electromagnet, comprising a plurality of cores defining poles arranged to attract and support at least predominantly ferromagnetic objects; exciting coil means for said cores; and sensor means for generating control signals in response to influencing of the magnetic field of the electromagnet by an at least predominantly ferromagnetic object, said sensor means being disposed at least substantially centrally with reference to the poles of said cores and comprising a plurality of discrete sensors which are symmetrical to one another with reference to the center of the electromagnet, said sensor means further comprising at least one induction coil surrounding one of said cores.

4,544,986

METHOD OF ACTIVATING AN ELECTROMAGNETIC POSITIONING MEANS AND APPARATUS FOR CARRYING OUT THE METHOD

Josef Büchl, Rehsteig 12, D-8071 Lentig, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,030
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307683
Int. Cl.[4] H01H 47/32
U.S. Cl. 361—152 13 Claims



1. Method of activating an electromagnetic positioning means of the kind comprising a positioning member having an armature affixed thereto, electromagnets for driving the armature between first and second terminal positions, spring means for biasing the armature into a rest position between the first and second terminal positions, and means for energizing the elctromagnets to drive the armature to the terminal positions,

the armature together with the positioning member and the spring means constituting an oscillatory system having a predetermined resonant frequency, wherein the method comprises the steps of:

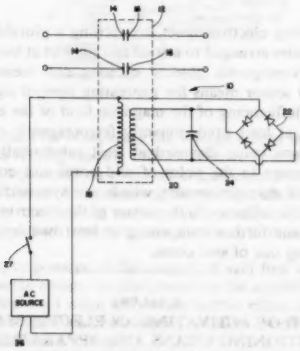
a. alternatingly energizing the electromagnets at a frequency substantially equal to the resonant frequency of the system for a time sufficiently long to activate the positioning means by swinging the armature in oscillating steps toward the first and second terminal positions;
b. maintaining the energizing frequency of the electromagnets during the initial oscillations greater than the resonant frequency of the system;
c. continuously reducing the energizing frequency to zero after the armature has reached a terminal position; and
d. thereafter maintaining one of the electromagnets in an energized state.

4,544,987

MAGNETICALLY OPERATED AC SWITCHING DEVICE WITH DELAY-ON-DROPOUT

Dennis J. Loring, Pawtucket, R.I., assignor to Elmwood Sensors, Inc., Pawtucket, R.I.

Filed Sep. 19, 1983, Ser. No. 533,153
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—194 **6 Claims**



1. A magnetically operable AC switching device comprising:

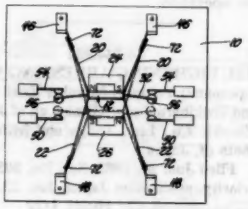
a. a body made of an electrical insulating material;
b. a fixed contact on said body;
c. a fixed magnetically responsive element on said body;
d. a movable magnetically responsive element on said body biased to a first position of spaced disengagement from said fixed magnetically responsive element but movable to a second position of engagement therewith;
e. a movable contact mounted in electrically insulated relation on said movable element for movement therewith so that it is in engagement with said fixed contact in one of said movable element positions and in spaced disengagement therefrom in the other of said movable element positions;
f. an AC pickup winding mounted on one of said magnetically responsive elements for effecting the magnetic energization thereof upon the electrical energization of said pickup winding with an AC power source for moving said movable element from said first to said second position thereof;
g. a DC holding winding mounted on one of said magnetically responsive elements for maintaining said movable element in said second position thereof, said pickup winding and said holding winding being constructed so that when said fixed and movable elements are in engagement, the magnetic attraction therebetween produced by said holding winding is greater than the magnetic attraction therebetween produced by said pickup winding throughout the cycle of the AC power connected to said pickup winding to permit said pickup winding to remain energized when said fixed and movable elements are in engagement;
h. capacitor means electrically connected across said holding winding; and
i. rectifier means electrically connected across said holding winding in parallel with said capacitor means for supplying DC power to said holding winding and to said capacitor means upon connection of said rectifier means to said AC power source, whereby the energy stored in said capacitor means delays the movement of said movable magnetically responsive element from said second position to said first position upon the deenergization of said AC power source.

4,544,988

BISTABLE SHAPE MEMORY EFFECT THERMAL TRANSDUCERS

Peter A. Hochstein, Troy, Mich., assignor to Armada Corporation, Detroit, Mich.

Filed Oct. 27, 1983, Ser. No. 545,789
Int. Cl.⁴ H01H *47/26*
U.S. Cl. 361—211 **10 Claims**



1. An electrothermal actuator assembly comprising: support means (10); primary means (12, 14, 15, or 16) supported by said support means (10) for movement between first and second positions; a first temperature-sensitive element (20) made of material which exhibits shape memory due to thermoelastic, martensitic phase transformation extending between said support means (20) and said primary means (12, 14, 15, or 16); said first element (20) being responsive to an increase in temperature above a predetermined transition temperature for reacting between said primary means (12, 14, 15, or 16) and said support means (10) to move said primary means (12, 14, 15, or 16) to said second position; characterized by a second temperature-sensitive element (22) made of material which exhibits shape memory due to thermoelastic, martensitic phase transformation extending between said support means (10) and said primary means (12, 14, 15, or 16); said second element (22) being responsive to an increase in temperature above said transition temperature for reacting between said primary means (12, 14, 15, or 16) and said support means (10) to move said primary means (12, 14, 15, or 16) to said first position; and said primary means including biasing means (24, 26, 28, or 24', 26', 28', or 34) for maintaining said primary means (12, 14, 15, or 16) in said first position until said first element (20) is heated sufficiently to move said primary means (12, 14, 15, or 16) to said second position and for maintaining said primary means (12, 14, 15, or 16) in said second position until said second element (22) is heated sufficiently to move said primary means (12, 14, 15, or 16) to said first position, and circuit means for supplying electrical current through said first element (20) a limited time period sufficient to provide said increase in temperature thereof while preventing current flow through said second element (22) to move said primary means (12, 14, 15, or 16) to said second position and for supplying electrical current

through said second element (22) a limited time period sufficient to provide said increase in temperature thereof while preventing current flow through said first element (20) to move said primary means to said first position.

4,544,989

THIN ASSEMBLY FOR WIRING SUBSTRATE

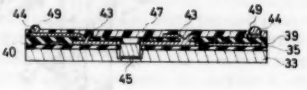
Shigeo Nakabu, Nara; Yuji Matsuda, Yao; Hirokazu Yoshida, Osaka; Masaru Iwasaki, Izumisano; Takashi Nukii, Nara, and Katunobu Awane, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1981, Ser. No. 277,807

Claims priority, application Japan, Jun. 30, 1980, 55-90128; Jun. 30, 1980, 55-90129

Int. Cl.⁴ H05K *1/18*

U.S. Cl. 361—401 **6 Claims**



1. A thin device for attaching and electrically connecting an electrical component to an external circuit, comprising:

a substrate;

an aperture within said substrate for accommodating said electrical component therein;

a first insulating layer of organic material formed over said substrate, said first insulating layer having an opening therein in a position corresponding to said aperture in said substrate, said first insulating layer extending within an area defined by said aperture;

first wiring means comprising a pattern of electrical circuit paths deposited on said first insulating layer;

means for connecting said first wiring means to said electrical component;

a second insulating layer of organic material formed over said first insulating layer and said first wiring means;

second wiring means comprising a pattern of electrical circuit paths deposited on said second insulating layer;

said second insulating layer comprising holes therein at positions corresponding to circuit paths of said first wiring means and said second wiring means comprising portions thereof extending through said holes into electrical contact with said first wiring means;

a third insulating layer of organic material formed over said second insulating layer and said second wiring means;

said third insulating layer comprising a plurality of holes therein at positions corresponding to circuit paths of said second wiring means, and a plurality of solder terminals in electrical contact with said second wiring means and extending through said holes in said third insulating layer for connecting said device to an external circuit, the distance between said terminals being substantially 350 microns.

4,544,990

ILLUMINATING TELESCOPIC DEVICE

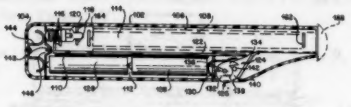
Alex Wieselman, 4 Terry Ter., Livingston, N.J. 07039, and Leonard D. Prince, 7855 Blvd. East, North Bergen, N.J. 07047

Filed Sep. 17, 1984, Ser. No. 651,251

Int. Cl.⁴ F21V *7/04*

U.S. Cl. 362—32 **24 Claims**

1. A light illuminating device comprising a housing having an internal compartment, an element mounted for extension along its longitudinal axis from a storage position within said compartment and internally of said housing to an operative position extending away from said compartment and externally of said housing, and means contained within said housing for



internally illuminating said element when in said operative position.

4,544,991

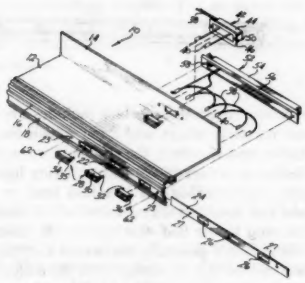
LIGHTED RUNNING BOARD

Ralph E. Gorsuch, Elkhart, Ind., assignor to Elkhart Machine & Tool Co., Inc., Elkhart, Ind.

Filed Dec. 24, 1984, Ser. No. 685,388

Int. Cl.⁴ B60Q *1/32*

U.S. Cl. 362—81 **2 Claims**



1. A running board for a vehicle, said board including a horizontal deck, a kick plate having inner and outer faces extending upwardly from a rear edge of said deck, a rib having inner and outer faces extending downwardly from a front edge of said deck, one of said kick plate and rib including an opening formed therein, and a light fixture positioned within said opening, wire means for connecting said light fixture to a power source, the improvement wherein said light fixture includes a peripheral clip member, said clip member constituting means for snap fit interlock of said light fixture to said one kick plate or rib within said opening, said light fixture at least partially overlying the outer face of said one kick plate or rib with said clip member being so interlocked with the one kick plate or rib, a cover member overlying said opening and light fixture at the rear face of said one kick plate or rib, said cover member attached to said rear face and housing said wire means.

4,544,992

LIGHTING FIXTURE INSULATING SYSTEM

Craig H. Cover, P.O. Box 755, Newtown, Pa. 18940

Filed Oct. 3, 1983, Ser. No. 538,172

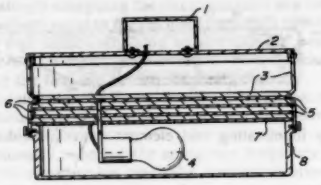
Int. Cl.⁴ F21S *1/14*

U.S. Cl. 362—147 **9 Claims**

1. In a lighting fixture having a mounting pan for ceiling or wall mounting, thermal insulation affixed to said mounting pan, and a lightbulb, the improvement, comprising:

thermal insulation containing two or more layers of a low-emissivity polymer,

a metal deposited on each polymer layer, and



an insulating spacer material located between the layers of said metallized polymer.

4,544,993

FLOOR ILLUMINATING BEDSIDE LIGHT UNIT

Johnie C. Kirk, 531 Ivanhoe, Ypsilanti, Mich. 48197

Filed Jan. 9, 1985, Ser. No. 690,080

Int. Cl.[4] F21S *5/00*; F21L *1/00*

U.S. Cl. 362—153 **3 Claims**

1. In a bedroom environment which includes a bed in which an occupant normally sleeps and from which the occupant normally leaves and to which the occupant normally returns when the bedroom is dark, a floor illuminating light and foot mat assembly positioned on the bedroom floor at a position alongside the bed in which the occupant when normally leaving and returning to the bed will step on the assembly, said assembly comprising a generally horizontal foot mat member, switch means operatively associated with the underside of said foot mat member for actuation in response to foot pressure on said mat member, and floor illuminating light members operatively associated with said switch means for "on/off" operation in response to actuation of said switch means whereby said assembly is operable to illuminate the floor of said dark bedroom when the bed occupant steps on the mat when leaving the bed and continue said illumination until the occupant steps on the mat when returning to the bed.

4,544,994

KNUCKLED LAMP HEAD BRACKET MOUNT FOR GENERATOR

John K. Steeves, Jr., Rochester, N.Y., assignor to Tele-Lite, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 402,964, Jul. 29, 1982, Pat. No. 4,464,706. This application Jul. 16, 1984, Ser. No. 631,474

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.[4] B62J *5/08*

U.S. Cl. 362—192 **10 Claims**

1. A lamp head bracket mount for mounting a lamp head with a front face and a back on an engine-driven electric generator with a generally rectangular housing, one end of which is generally rectangular, said lamp head and bracket mount, when assembled together and attached to said generator housing, comprising:

a. a bracket that fits closely over said one end of said generator housing;

b. said bracket being vertically oriented and having a frame portion that extends around the perimeter of said end of said generator housing;

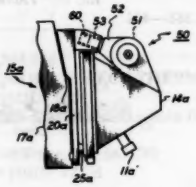
c. said lamp head having a supporting knuckle;

d. said supporting knuckle having a mounting arm arranged so said lamp head is pivotally movable through said knuckle relative to said mounting arm;

e. an upper region of said bracket having a socket;

f. said mounting arm being arranged for fitting into said socket so that said mounting arm is fixed relative to said bracket and orients said knuckle to pivot said lamp head about a horizontal axis;

g. said lamp head being movable between an upwardly aimed position and a folded position in which said front face of said lamp head is folded closely against said bracket and said end of said generator housing for protective storage;



h. a lower region of said bracket having a stop limiting said folded position of said front face of said lamp head against said bracket;

i. an underside of said socket and mounting arm sloping downward away from said upper region of said bracket to provide clearance for said lamp head in said folded position against said bracket closely underneath said socket;

j. an upperside of said socket and mounting arm sloping downward from said upper region of said bracket to provide clearance for tilting said lamp head into said upwardly aimed position; and

k. said mounting arm and said socket being hollow and providing a conduit for electric conductors entering said upper region of said bracket and extending through said mounting arm and said knuckle to said lamp head.

4,544,995

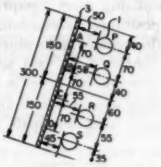
APPARATUS FOR TESTING LIGHT FASTNESS OF A MATERIAL

Shigeru Suga, 20-2 Yoyogi, 5-chome, Shibuya-ku, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,397

Int. Cl.[4] G01N *17/00*; F21S *3/00*

U.S. Cl. 362—225 **3 Claims**



1. In a light fastness testing apparatus having a housing with a test chamber therein and two downwardly and outwardly inclined specimen supporting walls on opposite sides of said chamber and two downwardly and outwardly extending rows of horizontally positioned equal intensity ultraviolet fluorescent lamps one lying generally along each of the specimen supporting walls, with four lamps in each row, the improvement comprising:

the uppermost lamp in each row having the midpoint thereof spaced downwardly from the upper edge of the specimen supporting wall a distance substantially equal to the dis-

tance that the midpoint of the next lower lamp is spaced above the midpoint of the dimension of the specimen supporting wall which wall dimension is measured along the wall from the top to the bottom thereof, the midpoints of the uppermost and next lower lamps being spaced from each other slightly less than twice said equal distance in a direction parallel to said specimen supporting wall, the midpoint of the third lowest lamp being spaced downwardly from said wall midpoint and the midpoint of the lowermost lamp being spaced upwardly from the lower edge of the specimen supporting wall slightly more than half the distance said third lowest lamp is spaced downwardly from said wall midpoint and in a direction parallel to said specimen supporting wall, said lowermost lamp being spaced from said third lowest lamp slightly less than said third lowest lamp is spaced from said wall midpoint;

the surface of the uppermost lamp closest to said specimen supporting wall being spaced perpendicular to the specimen supporting wall about one-sixth of the dismension of the specimen supporting wall along the wall from the top to the bottom thereof, the surface of the lowermost lamp being spaced slightly closer to the specimen supporting wall than the uppermost lamp, the surface of the third lowest lamp being spaced slightly farther from the specimen supporting wall than the uppermost lamp, and the surface of the next lower lamp being spaced still slightly farther from the specimen supporting wall than the thrid lowest lamp.

4,544,996

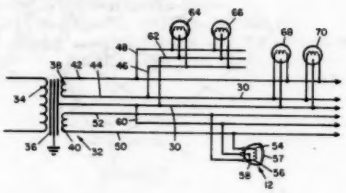
UNDERWATER LIGHTING SYSTEM WITH GROUNDED RETURN LINE

Benjamin B. George, Santa Ana, Calif., assignor to Tivoli Industries, Inc., Santa Ana, Calif.

Filed Jul. 13, 1984, Ser. No. 630,844

Int. Cl.[4] F21V *11/00*

U.S. Cl. 362—238 **13 Claims**



1. A lamp comprising:

a sealed envelope;

a filament disposed within the envelope;

first and second electrical conductors each extending from a point at the exterior of said envelope through said envelope and each being connected at the interior of the envelope to a respectively associated end of said filament; and

a third electrical conductor extending from a point at the exterior of said envelope to the interior of said envelope to a point proximate to but separated from said first and second conductors and said filament and having no internal connection to said first or second conductor and no connection to said filament.

4,544,997

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Antonius M. J. H. Seuter, and Petrus F. J. van den Boom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1983, Ser. No. 506,927

Claims priority, application Netherlands, Jul. 9, 1982, 8202778

Int. Cl.[4] F21K *2/00*

U.S. Cl. 362—263 **8 Claims**

1. A low-pressure mercury vapour discharge lamp comprising a glass discharge envelope containing mercury and a rare gas and in which during operation of the lamp a discharge is present and which contains mercury and a rare gas, characterized in that at least a part of the inner surface of the wall of the discharge envelope is provided with a thin, at least substantially homogeneous, continuous layer, resistant to the influence of the discharge, transparent to light and radiation from said discharge, and consisting essentially of an oxide consisting of oxygen and at least one of the elements selected from the group consisting of yttrium, scandium, lanthanum, gadolinium, ytterbium and lutetium.

4,544,998

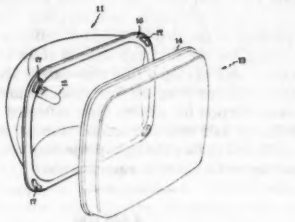
SEALED LAMP

Bruce E. Shanks, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 426,488, Sep. 29, 1982, abandoned. This application Nov. 21, 1984, Ser. No. 674,358

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—267 **2 Claims**



1. A rectangular shaped all glass lamp comprising a rectangular shaped glass lens member adhesively sealed directly to a correspondingly shaped front of a glass reflector member by cooperating and opposing flat planar sealing surfaces, said lens member being provided with a flat planar surface rim extending toward and substantially against a flat planar mating surface of the reflector member, said reflector member being provided with integral positioning members extending therefrom only at each corner thereof and fitting inside by direct physical abutment with the corners of said extending rim to align the lens and reflector members together, and with said positioning members being spaced apart from the planar sealing surface of said lens member to limit residual stresses to the corner regions when said lens and reflector members are sealed together.

4,544,999

MARKER LIGHT

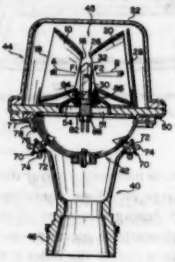
Hisashi Kawanami; Kiyoshi Suzuki, both of Yokohama, and Akihiro Kawauchi, Kawasaki, all of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Continuation of Ser. No. 421,778, Sep. 23, 1982, abandoned. This application Jan. 10, 1985, Ser. No. 690,420

Claims priority, application Japan, Sep. 30, 1981, 56-155302

Int. Cl.[4] F21V *7/09*; F21M *1/00*

U.S. Cl. 362—298 **9 Claims**



1. A marker light comprising:

first and second reflectors each having a focus, a reflection surface which is a quadric of revolution, a small opening at the vertex and, a large opening for projecting light, through a side opposite said vertex; said focus being positioned at a point along an optical aixs of said quadric of revolution and between said small and large openings, the small openings of said first and second reflectors facing each other and said focuses being separated from each other;

an incandescent lamp, having a flat filament provided along said optical axes of the first and second reflectors for emitting light; said filament being located outside the reflectors and lying between a pair of planes defined along said small openings at the vertex which are parallel to each other and are perpendicular to a plane parallel to said optical axes of said first and second reflectors, and the light from said light source being reflected from the first and second reflectors and supplied through the large openings of the first and second reflectors; and

a housing for the first and second reflectors and the light source, and having a first transparent section for passing light reflected from the first reflector and a second transparent section for passing light reflected from the second reflector; said first and second transparent sections being positioned to face the light projecting openings of the first and second reflectors, respectively.

4,545,000

PROJECTION LAMP UNIT

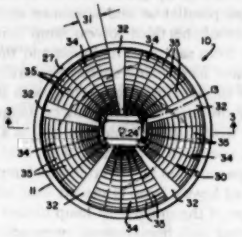
Lawrence R. Fraley, W. Boxford, Mass., and Arnold E. Westlund, Jr., Winchester, Ky., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 538,721, Oct. 3, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,584

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—304 **9 Claims**

1. In a projection lamp unit including a glass reflector having a concave reflecting surface and an incandescent lamp positioned within said glass reflector and having an envelope located within the concavity of said reflector and including a coiled filament positioned within said envelope and substantiallly centered at the focal point of said reflector, the improvement wherein said concave reflecting suface comprises a plurality of alternately disposed, radially extending surface regions each including a plurality of individual diffusing facets occupying a plurality of radial rows each of a substantially tapered configuration having a maximum width at the periphery of said reflector, said surface regions of diffusing facets alternating respectively with a plurality of substantially equally spaced specular stripes each having a highly polished, mirrorlike finish and also being of a substantially tapered con-



figuration having a maximum width at said periphery of said reflector, the combination of said regions of said diffusing facets and said specular stripes providing optimization of total optical output and beam pattern uniformity regardless of the placement of said coiled filament structure relative to the orientation of said regions of said facets and said stripes.

4,545,001

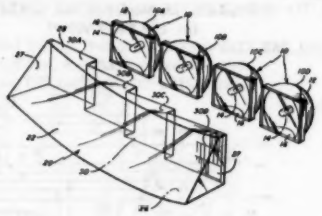
SEALED LENS MEMBER FOR USE IN A MOTOR VEHICLE LIGHTING SYSTEM

George J. English, Reading, and Robert E. Levin, South Hamilton, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 10, 1984, Ser. No. 598,604

Int. Cl.[4] F21V *5/02*

U.S. Cl. 362—340 **9 Claims**



1. A lens member for use in a lighting system designed for providing forward illumination for a motor vehicle wherein said lighting system includes a plurality of individual light sources located adjacent each other, said lens member comprising:

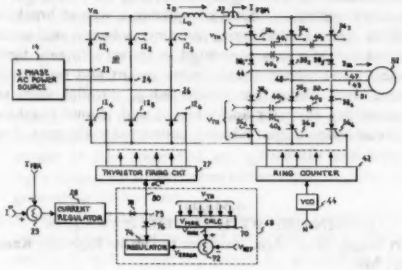
a hollow, enclosed single piece element having a front, clear surface adapted for coinciding with the front, contoured surface of said motor vehicle, a rear lensing portion positioned at a predetermined angle relative to said individual light sources for having the light emitted by said sources pass therethrough, and a plurality of side walls for enclosing said element to provide a sealed, dirt-free member, said front clear surface and said side walls not including lensing elements thereon or as part thereof.

4,545,002

THYRISTOR VOLTAGE LIMITER FOR CURRENT SOURCE INVERTER

Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Jun. 28, 1983, Ser. No. 508,712
Int. Cl.[4] H02H 7/22; H02P 13/24
U.S. Cl. 363—37 **35 Claims**



1. A control circuit for protecting the controlled rectifiers of an electrical power inverter comprising:

(a) a force commutated current source inverter including a plurality of controlled rectifier devices having first and second power electrodes;

(b) means for sensing the voltage across the first and second power electrodes of at least one of said controlled rectifier devices;

(c) means for comparing the sensed voltage across said first and second power electrodes against a reference voltage corresponding to a signal proportional to a safe operating voltage for said controlled rectifier devices and generating a control signal therefrom; and

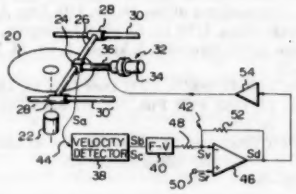
(d) means responsive to said control signal for controlling the current within said inverter to thereby prevent an increase in the voltage across said power electrodes above said reference voltage.

4,545,003

PICK-UP DEVICE POSITIONING ARRANGEMENT IN AN INFORMATION DISC PLAYER

Hiroyuki Hirano; Toshihiko Kurihara; Taichi Akiba, and Yositsugu Araki, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,192
Claims priority, application Japan, Apr. 22, 1981, 56-061004
Int. Cl.[4] G11B 7/00, 21/10
U.S. Cl. 369—43 **14 Claims**



1. A pick-up device positioning arrangement for controlling a radial position of a pick-up device with respect to a turn-table in an information disc player, said pick-up device having a pick-up point to be aligned onto a target track of a disc mounted on said turn-table under control of a tracking servo system which operates in accordance with a tracking error signal representative of an amount of deviation of said pick-up point from said target track, said pick-up device producing an information signal, the improvement which comprises:

an envelope detector for producing an envelope frequency of said information signal;

a frequency to voltage converter means connected to said envelope detector, for producing a detection signal representative of the envelope frequency; and

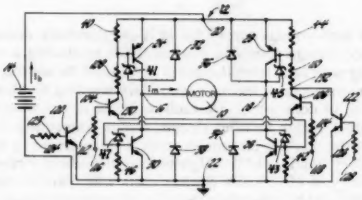
drive means for driving said pick-up device for relative movement radially of said disc at a velocity according to said detection signal.

4,545,004

BRIDGE DRIVER CIRCUIT FOR A DC ELECTRIC MOTOR

Alexander Kade, Detroit, and Thomas A. Radomski, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1984, Ser. No. 592,366
Int. Cl.[4] H02P 7/14
U.S. Cl. 363—63 **3 Claims**



1. For a DC motor controller of the bridge circuit type including a motor connected across one pair of opposing bridge terminals and a source of direct current connected across the other pair of opposing bridge terminals, two pairs of power transistors, the transistors of each such pair being connected in diagonally opposed legs of the bridge such that the motor is energized with current from the source in one direction when both transistors of one pair are biased conductive and in the opposite direction when both transistors of the other pair are biased conductive, and a driver transistor for each pair of power transistors, each such driver transistor being effective (1) when biased conductive to supply drive current to both transistors of the associated power transistor pair for biasing both such transistors conductive with a minimum amount of driver loss, and (2) when subsequently biased nonconductive to interrupt the supply of drive current to both transistors of such power transistor pair, thereby rendering both power transistors thereof nonconductive to interrupt motor energization, whereafter inductive current stored in said motor is reversed through said source, the improvement comprising:

an auxiliary transistor for each of said driver transistors, each such auxiliary transistor being effective (1) when nonconductive to permit the respective driver transistor to supply drive current to both transistors of the associated power transistor pair for biasing both such transistors conductive with a minimum amount of driver loss, and (2) when biased conductive to divert drive current away from one transistor of the associated power transistor pair, rendering such one transistor nonconductive to interrupt motor energization, whereafter inductive current stored in the motor is circulated through the other transistor of said power transistor pair instead of said source, thereby to avoid the power transistor switching losses occasioned by the reversal of current through said source.

4,545,005

HIGH-VOLTAGE SUPPLY FOR AN X-RAY GENERATOR

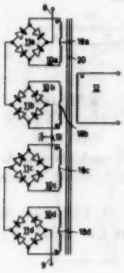
Leo M. Mudde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,855

Claims priority, application Netherlands, Jan. 22, 1982, 8200233

Int. Cl.⁴ H02N *7/06*

U.S. Cl. 363—68 **12 Claims**



1. A high-voltage supply for an X-ray generator comprising a direct voltage source, a converter for producing a voltage varying with time from the direct voltage of the source, a high voltage transformer having a secondary winding divided into a plurality of coils which are each included in a corresponding individual bridge rectifier circuit, means connecting the outputs of the rectifier circuits in series, characterized in that the secondary winding of the high-voltage transformer comprises a plurality of electrically distinct coils which are arranged in sequence side by side along the core of the high-voltage transformer, and each coil is connected to a corresponding one of a plurality of individual bridge rectifier circuits whose rectified outputs are connected in series of the same sequence, the winding senses of immediately adjacent coils being opposite to one another.

4,545,006

ELECTRONIC CHOPPER CIRCUIT AND A METHOD OF OPERATION

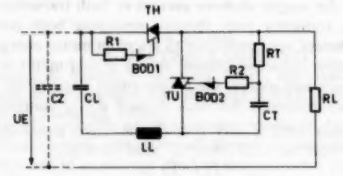
Janis Vitins, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 31, 1983, Ser. No. 528,064

Claims priority, application European Pat. Off., Sep. 23, 1982, 82201188.8

Int. Cl.⁴ H02H *9/04;* **H03K** *17/292*

U.S. Cl. 363—124 **4 Claims**



1. An electronic chopper circuit comprising:

a main thyristor connected to receive an input voltage;

a quenching diode connected antiparallel with said main thyristor;

a load resistance connected in series with said main thyristor;

a quenching circuit including a quenching capacitor, a quenching inductance and an antiparallel combination of a charging diode and a quenching thyristor wherein said quenching circuit is connected in parallel with said main thyristor;

a first breakover circuit comprising a first breakover diode and a first series resistance wherein said first breakover circuit is connected in parallel with said main thyristor and has an output connected to the gate of said main thyristor;

a timing means comprising a series circuit having a timing resistance and a timing capacitor; and

a second breakover circuit comprising a second breakover diode and a second series resistance wherein said second breakover diode is connected in series with said timing means and wherein said timing means and said second breakover circuit are connected in parallel with said quenching thyristor and wherein said second breakover circuit has an output which is connected to the gate of said quenching thyristor.

4,545,007

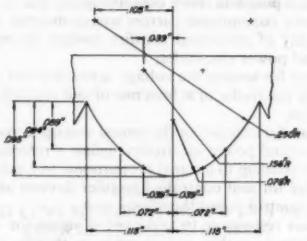
LUMINAIRE WITH LENTICULAR LENS

Robert Nagel, Mesa, Ariz., assignor to Devine Lighting, Kansas City, Mo.

Filed Sep. 12, 1984, Ser. No. 649,576

Int. Cl.⁴ F21V *7/04*

U.S. Cl. 362—329 **7 Claims**



1. A lenticular lens for distribution of light comprising a plurality of contiguous polygonally-perimetered lens elements, each said lens element having a light entrance surface and a light exit surface, said light entrance surface comprising an aspherical surface defined by a plurality of coaxial zones of different predetermined radii, said light exit surface being substantially planar.

4,545,008

METHOD AND AUTOMATIC CONTROL APPARATUS FOR CONTROLLING A TECHNOLOGICAL PROCESS

Mikhail A. Sominin, ulitsa Michurinskaya, 1, kv. 176; Valery N. Surikov, Belgradskaya ulitsa, 24, kv. 130; Jury A. Belokopytov, prospekt Kima, 7/19, kv. 67, all of Leningrad, and Evgeny P. Fesenko, ulitsa Stroitelei, 5, korpus 1, kv. 38, Moscow, all of U.S.S.R.

PCT No. PCT/SU81/00039, § 371 Date Dec. 14, 1982, § 102(e) Date Dec. 14, 1982, PCT Pub. No. WO82/03703, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 20, 1981, Ser. No. 453,885

Int. Cl.⁴ G05B *13/00, 13/02*

U.S. Cl. 364—148 **7 Claims**

4. An automatic control apparatus for automatically controlling a technological process, comprising:

an automatic controller for maintaining an output parameter of said process at a predetermined level;

a control quality signal generating device for generating a signal representative of an index of control quality;

a control signal generating circuit for generating a control signal depending on variation of said signal representative of the index of control quality;

a parameter adjusting device connected to the output of said control signal generating circuit for adjusting a parameter of said automatic controller;

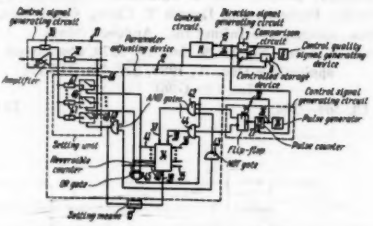
a controlled storage device having a data input connected to the output of said control quality signal generating device and a control input;

a direction signal generating circuit having an input connected to the output of said control quality signal generating device for generating a signal indicative of the direction of variation of the index of control quality and an output connected to the input of said control signal generating circuit for changing the signal at said output of said control signal generating circuit immediately after the direction of variation of the index of control quality changes from increasing to decreasing control quality;

a comparison circuit having a first input connected to the output of said controlled storage device and a second input connected to the output of said control quality signal generating device; and

a control circuit having inputs respectively connected to the output of said direction signal generating circuit and to the output of said comparison circuit for generating a binary signal having a first value when the magnitude of the difference between the current value of the index of control quality and its value stored in said controlled storage device exceeds a preselected value, and having a second value after the direction of variation of the index of control quality changes from increasing to decreasing control quality if the magnitude of the difference between the current value of the index of control quality and its value stored in said controlled storage device is smaller than said preselected value, said control circuit having an output connected to said control input of said control storage device to enable said controlled storage device to store the value of the index of control quality occurring just before said binary signal assumes said second value, said parameter adjusting device being connected to the output of said control circuit to abruptly change said parameter of the automatic controller, when said parameter attains a first predetermined value and said binary signal has said first value, to a limit value beyond the range of variation of said parameter during the period that said binary signal has said second value; said automatic control apparatus further comprising

setting means for setting said parameter adjusting device to a second predetermined value a predetermined time after said parameter achieves said first value, said second predetermined value being less than said first predetermined value.



4,545,009

FUEL COMBUSTION CONTROL SYSTEM

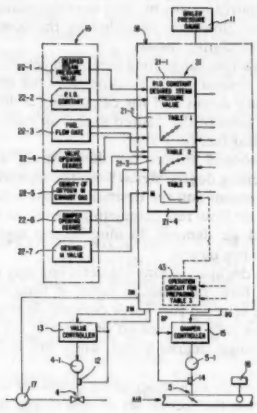
Ryoji Muraki, Nishinomiya; Seiiti Numata, Wakayama, and Kanji Hayashi, Takatsuki, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

Filed Nov. 26, 1982, Ser. No. 444,686

Claims priority, application Japan, Nov. 30, 1981, 56-193226

Int. Cl.[4] **G05B** *13/02;* **F23N** *5/00, 50/08*

U.S. Cl. 364—164 **4 Claims**



1. A fuel combustion control system for controlling fuel flow rate and air flow rate to a burning means in a burning device by controlling respective opening degrees of fuel control valve means and air control damper means in response to change in output of the burning device which comprises

pressure detecting means for detecting an output pressure of the burning device,

integrating means for detecting the fuel flow rate and integrating the fuel flow rate over a predetermined period of time to produce an actual fuel flow rate

first detecting means for detecting the opening degree of the fuel control valve means,

first control means for controlling the opening degree of the fuel control valve means,

second detecting means for detecting the opening degree of the air control damper means,

second control means for controlling the opening degree of the air control damper means,

storing means storing a set of predetermined data representative of a desired output value of the burning device, a set of first data representing a relationship between the opening degree of the fuel control valve means and the fuel flow rate, a set of second data representing a relationship between the opening degree of the air control damper means and the air flow rate, and a set of third data representing a relationship between the fuel flow rate and an excess air ratio,

estimated fuel flow rate calculating means for determining a selected fuel flow rate from the set of first data stored in the storing means, said selected fuel flow rate corresponding to the opening degree of the fuel control valve means detected by the first detecting means and integrating the selected fuel flow rate in a predetermined period of time to calculate an estimated fuel flow rate,

compensation coefficient calculating means for calculating a current compensation coefficient on the basis of the estimated fuel flow rate provided by the estimated fuel flow rate calculating means and the actual fuel flow rate provided by the integrating means, and updating a prior stored compensation coefficient stored during a prior operation by storing the current compensation coefficient,

desired fuel flow rate calculating means for calculating the

desired fuel flow rate on the basis of the output pressure data produced by the pressure detecting means and the desired output value of the burning device stored in the storing means,

compensated fuel flow rate calculating means for calculating compensated fuel flow rate data by applying the desired fuel flow rate provided by the desired flow rate calculating means to the compensation coefficient calculated by the compensation coefficient calculating means,

fuel valve control means for providing a signal for controlling said first control means by data corresponding to the compensated fuel flow rate provided by the compensated fuel flow rate calculating means,

desired air flow rate calculating means for selecting data representing the desired excess air ratio from the set of third data in the storing means and for calculating a desired air flow rate on the basis of the desired excess air ratio thus selected and the actual fuel flow rate,

air damper control means for determining a selected air damper opening degree signal from the second set of data in the storing means and the desired air flow rate provided by the desired air flow rate calculating means, and for applying the selected air damper opening degree signal to the air control damper means,

fuel flow rate deciding means for detecting any change of the actual fuel flow rate due to lapse of time and for either providing a selected fuel valve opening degree signal when the fuel flow rate is increased or shutting off a selected air damper opening degree signal when the fuel flow rate is decreased,

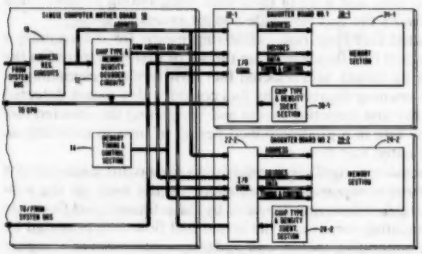
estimated excess air ratio calculating means for selecting an air flow rate from the second set of data stored in the memory means corresponding to the damper opening rate provided by the second detecting means and for calculating an estimated excess air ratio on the basis of the selected air flow rate and the estimated fuel flow rate provided by the estimated fuel flow rate calculating means, and

comparator means for comparing the estimated excess air ratio provided by the extimated excess air ratio calculating means and the excess air ratio and for either supplying the selected fuel valve opening degree signal or releasing the shut state of the selected air damper opening degree signal when the estimated air ratio exceeds the selected desired excess air ratio.

4,545,010
MEMORY IDENTIFICATION APPARATUS AND METHOD

Edward R. Salas, Billerica; Edwin P. Fisher, N. Abington; Robert B. Johnson, Billerica; Chester M. Nibby, Jr., Peabody, and Daniel A. Boudreau, Billerica, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 31, 1983, Ser. No. 480,964
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **49 Claims**



1. A memory system comprising a number of memory module boards and a main board coupled to said number of module boards, said main board including decoder circuit means for generating a number of decode selection signals in response to a predetermined multibit address portion of an address of each memory request applied to said system, said address being for specifying a location within said system to be accessed, each of said memory module boards including:

a memory section coupled to said decode circuit means for receiving selected ones of said decode selection signals, said memory section having a number of blocks of addressable memory chips, each block including a plurality of storage locations; and

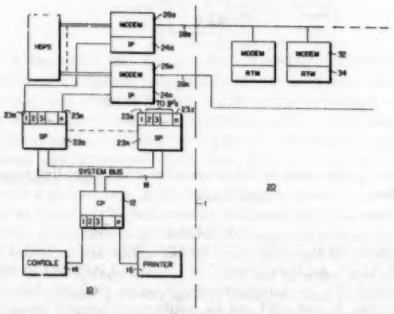
an identification section coupled to said decoder circuit means, said identification section including means for supplying a plurality of identification signals coded for indicating the type of chips and the populated density of said board,

said decoder circuit means being conditioned by said identification signals for decoding different address bit combinations of said predetermined multibit address portion selected as a function of said coded identification signals to generate said number of said decode selection signals in a manner which enables successive addressing of said pluralities of storage locations within each of said blocks of said number of memory module boards.

4,545,011
ENHANCED COMMUNICATIONS NETWORK TESTING AND CONTROL SYSTEM

David L. Lyon, Cambridge; Robert E. Huettner, Acton; Jerry L. Holsinger, Boston; Don I. Falkenstein, Lexington; Imtiaz Piracha, Peabody, and Dennis T. Ching, Cambridge, all of Mass., assignors to Infinet Inc., Andover, Mass.

Division of Ser. No. 7,629, Jan. 29, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,135
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **22 Claims**



1. In a network testing and control system for use with a digital communications network which provides digital communication between a plurality of sites, one of said sites being designated a central site and the other sites being designated remote sites and said digital communications between said central site and said remote sites being over a plurality of analog communications links, each remote site having means for generating a unique site address identifying said site, and wherein said remote sites can dynamically connect to and disconnect from said network, an improvement for reporting on the operational status of remote sites connected to said communication network communications links, said improvement comprising, at the central site

means for polling the remote sites connected to said communications links with an address inquiry signal to determine their addresses;

means for storing at the central site a record of the addresses determined by remote site responses to such polling, to

provide a site location table containing the addresses of the remote sites;

means for updating said site location table as remote sites connect to and disconnect from said communications links;

means for transmitting, over said communications links in a shared and selectively concurrent arrangement with said digital communications network, a status request signal to each remote site address contained in the site location table, in response to a command, to evoke a status signal from each remote site indicative of the status of at least one selected variable associated with that remote site, said variable comprising a status condition, signal or operating parameter at the remote site; and

means for receiving remote site status signals transmitted from remote sites over said communication links in a shared and selectively concurrent arrangement with said digital communications network.

4,545,012

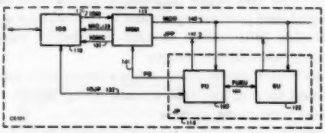
ACCESS CONTROL SYSTEM FOR USE IN A DIGITAL COMPUTER SYSTEM WITH OBJECT-BASED ADDRESSING AND CALL AND RETURN OPERATIONS

Gerald F. Clancy, Saratoga, Calif.; Stephen I. Schleimer, Chapel Hill; Craig J. Mundie, Cary, both of N.C.; Steven J. Wallach, Saratoga, Calif.; Richard G. Bratt, Wayland, and Edward S. Gavrin, Lincoln, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,522

Int. Cl.[4] G06F *7/06*

U.S. Cl. 364—200 **26 Claims**



1. In a digital computer system including

(A) memory means for performing memory operations including storing and providing items of data, said items of data including instructions, and

(B) processor means connected to said memory means for performing operations in response to instructions including processing items of data

and further wherein

said instructions are contained in procedures of said data items and said processor means responds to an instruction while executing the procedure containing said instruction, and the operations performed by said processor means include

(a) a call operation suspending the execution of a current procedure and commencing the execution of another procedure and

(b) a return operation for terminating the execution of said another procedure and resuming the execution of the procedure which was suspended,

an access control system comprising:

(1) memory organization means operative on said memory means for organizing said memory means into objects allowing the location of said data items therein and limiting access to an object to selected procedures and thereby defining domains, each procedure having access only to objects belonging to a single domain;

(2) memory operation specifier generation means in said processor means responsive to instructions for providing a memory operation specifier for each data item processed by processor, the memory operation specifier for a given data item specifying the object in which said data item is to be located;

(3) memory operation means operative on said memory means and responsive to a memory operation specifier for performing the memory operation specified thereby only when the object specified in said memory operation specifier belongs to the domain to which the procedure containing the instruction to which said processor means is currently responding has access;

(4) a secure stack object of said objects upon which only said access control system performs said memory operations;

(5) means responsive to a call operation when said call operation commences execution of another procedure having a different domain for saving in said secure stack object information required to return to the domain of the procedure whose execution is being suspended; and

(6) means responsive to a return operation when said return operation terminates the execution of a procedure having a different domain from that of the procedure whose execution is being resumed for obtaining said saved information from said secure stack object for the procedure whose execution is being resumed.

4,545,013

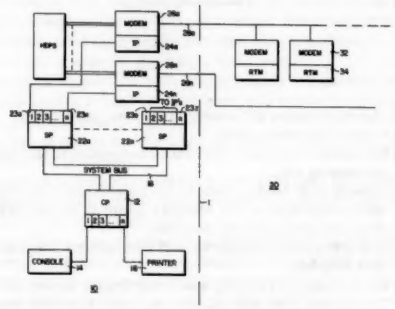
ENHANCED COMMUNICATIONS NETWORK TESTING AND CONTROL SYSTEM

David L. Lyon, Cambridge; Robert E. Huettner, Acton; Jerry L. Holsinger, Boston; Don I. Falkenstein, Lexington; Imtiaz Piracha, Peabody, and Dennis T. Ching, Cambridge, all of Mass., assignors to Infinet Inc., Andover, Mass.

Continuation of Ser. No. 7,629, Jan. 29, 1979, abandoned. This application Dec. 31, 1981, Ser. No. 336,296

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **18 Claims**



1. A communications network testing and control system for use with a digital communications network which provides digital communications between a dynamically changing plurality of sites via analog communications links, one of said sites being designated a central site and each other site being designated a remote site, and each site having a modem connected to at least one such analog link for communicating therethrough with at least one other site, said communications network testing and control system, at said central site, comprising:

first, second and third data processing systems;

means for entering commands to said first data processing system for real time control of the operation of the network testing and control system;

means for displaying information representing real time data from the first data processing system;

the third data processing system communicating with a remote site over said communications links in a shared and selectively concurrent arrangement with said communications network;

the first and second data processing systems having means for communicating therebetween byte-wise in parallel;

the second and third data processing systems having means for communicating therebetween bit-wise serially;

the second data processing system thereby communicating with both the first and third data processing systems and including means for converting said byte-wise data from the first processing system to serial bit-wise data for the third data processing system;

the third data processing system having means for communicating serially with the remote site in said shared arrangement with said digital communications network; and

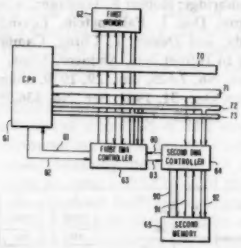
communications signals between the second data processing system and the remote site over said communications links being translated by the third data processing system into a format compatible with the destination of the signals.

4,545,014

INFORMATION PROCESSING APPARATUS

Tetsuji Oguchi, Tokyo, Japan, assignor to Nippon Electric Co., Inc., Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 325,086
Claims priority, application Japan, Nov. 26, 1980, 55-166297
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **1 Claim**



1. An information processing apparatus, comprising:

a central processing unit;

a first address bus and a first data bus coupled to said central processing unit;

a transfer unit having data to be transferred, said transfer unit comprising a first memory coupled to said first address bus and said first data bus;

a first controller coupled to said first address bus and said first data bus;

a storing unit, said storing unit comprising a second controller having first and second registers, said first register being coupled to said first memory via said first data bus;

coupling means for coupling said first register to said second register;

a receiver unit for receiving data transferred from said transfer unit, said receiver unit comprising a second memory;

a second address bus and a second data bus for coupling said second memory and said second controller, said second register being coupled to said second memory via said second data bus;

said first controller comprising means for controlling a data transfer from said first memory to said second memory by providing a first address through said first address bus to said first memory for reading a first data out of said first memory, the read-out first data being stored in said first register via said first data bus, said second controller including means for transferring said first data from said first register to said second register while said first controller transfers a second address to said first memory for reading out a second data; and

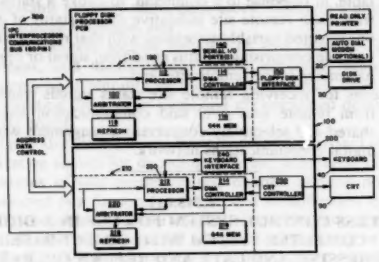
said second controller further comprising means for transferring said first data from said second register to said second memory via said second data bus while the read-out second data from said first memory is simultaneously stored into said first register.

4,545,015

WORD PROCESSING SYSTEM WITH FOREGROUND/BACKGROUND CAPABILITY

Steven C. Baunach, San Jose; James A. Riley, Santa Clara, and Lucy Okimura, Milpitas, all of Calif., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,390
Int. Cl.[4] G06F *3/14, 3/04*
U.S. Cl. 364—200 **20 Claims**



1. A word processing system, comprising:

(a) display means for displaying text;

(b) processing means for processing information and for controlling said display means, said processing means having means for running a first job in a foreground mode while a second job runs independently and concurrently in a background mode.

(c) first buffer means for storing display information relating to said first job, said buffer means interacting with said display means and said processing means so that at least a portion of said display information in said first buffer means is displayed by said display means;

(d) second buffer means for storing display information relating to said second job, said second buffer means interacting with said processing means;

(e) input means for entering textual information and commands into said system, said input means including means for operating under the control of said first job so that an operator may intervene in the processing of said first job; and,

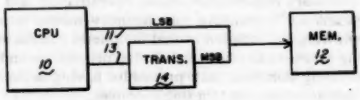
(f) said processing means including means responsive to a particular command from said input means to interchange said buffer means and to transfer control of said input means to said second job so that said operator may intervene in the processing of said second job; and including means responsive to a subsequent particular command from said input means to again interchange said buffer means and retransfer control of said input means to said first job.

4,545,016

MEMORY MANAGEMENT SYSTEM

Michael F. Berger, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Jan. 7, 1983, Ser. No. 456,448
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—200 **10 Claims**



1. In a multi-tasking computer system including a processor having multiple address and data lines, and a memory for partitionally storing multiple programs with each program having a predetermined base address, memory management circuitry comprising: means for storing an off-set indicia with

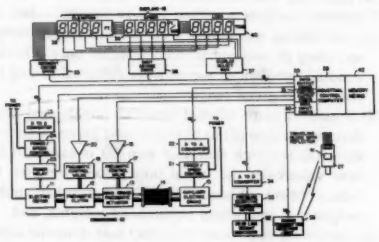
each off-set indicia so stored being associated with a corresponding program stored in memory, said means for storing an off-set indicia comprising first and second off-set register means each defining an end bound of the off-set number range and means for mutually exclusively enabling the first and second off-set register means, means for combining said off-set indicia with said base address to provide an effective address, said means for combining comprising first and second adder means with each adder means having one input means for receiving said base address, another input means coupled from the off-set register means and an output means at which is provided the effective address, means coupling the effective address to the memory to access the running program, means for storing a limit indicia with each limit indicia so stored being associated with a corresponding program stored in memory, said means for storing a limit indicia comprising first and second limit register means each defining an end bound of the limit number range and means for mutually exclusively enabling the first and second limit register means, and comparator means having one input means for receiving the limit register means address, another input means for receiving the effective address and an output means for providing an error signal when the effective address falls outside of the limit register means address.

4,545,017

WELL DRILLING APPARATUS OR THE LIKE WITH POSITION MONITORING SYSTEM

Eugene M. Richardson, Pasadena, Tex., assignor to Continental Emsco Company, Dallas, Tex.

Filed Mar. 22, 1982, Ser. No. 360,715
Int. Cl.[4] G01P *3/68*
U.S. Cl. 364—422 **47 Claims**



1. A well drilling apparatus comprising:

(a) a mast structure having movably mounted therein a traveling block means;

(b) a drawworks coupled by a cable to said traveling block for controlling the elevation of said traveling block within said mast structure;

(c) a transmitter/receiver means mounted on said apparatus, said transmitter/receiver means including (i) means for periodically transmitting signals which are reflected by said traveling block means, and (ii) means for receiving the signals reflected by said traveling block means whereby the position of said traveling block means within the mast structure is monitored;

(d) said traveling block means including a reflector means mounted thereon to enhance the signals being reflected by said traveling block means back to said transmitter/-receiver means; and

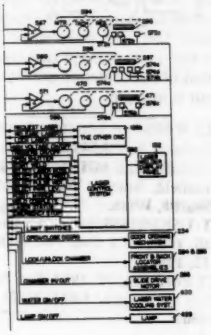
(e) control means having a time reference and a memory means and being coupled to said transmitter/receiver means and responsive to the position monitored by said transmitter/receiver means for controlling the drawworks to restrict movement of the traveling block at preselected elevations.

4,545,018

CALIBRATION OF AUTOMATED LASER MACHINING APPARATUS

Jack W. Clements, Trafford, and John R. Faulkner, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,272
Int. Cl.[4] B23K *26/12*; G05D *25/00*
U.S. Cl. 364—474 **17 Claims**



1. Computer controlled apparatus for laser machining a work piece in a sequence of at least first and second laser machining steps, the first and second laser machining steps including machining with a laser beam generated in accordance with at least first and second sets of distinct lasing parameters corresponding to first and second machining modes, respectively, said laser machining apparatus comprising:

(a) a laser source for emitting a laser beam;

(b) means responsive to a control signal for exciting said laser source to emit the laser beam of a power corresponding to said control signal;

(c) optical means for directing the beam along a laser path onto the work piece;

(d) means disposable to intercept the laser path for measuring the power of the laser beam as it would be directed onto the work piece; and

(e) computer control means coupled to each of said exciting means and said measuring means, and including calibration means responsive to the measured power of the directed laser beam for providing the control signal for each of said first and second machining modes as a function of the measured power and the first and second sets of laser parameters, respectively.

4,545,019

AIRCRAFT IN-FLIGHT CENTER OF GRAVITY MEASURING SYSTEM

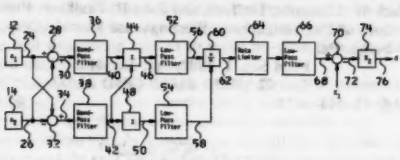
John H. Glover, Bothell, Wash., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 18, 1982, Ser. No. 389,803
Int. Cl.[4] G01M *1/12*
U.S. Cl. 364—463 **28 Claims**

4. An aircraft in flight center of gravity measuring system comprising:

a plurality of inertial sensors secured to the aircraft wherein the inertial sensors generate signals representing rotation of the aircraft about a predetermined axis through the aircraft center of gravity wherein the predetermined axis is the yaw axis of the aircraft; and

signal processing means connected to the inertial sensors for generating from the inertial sensors a signal representing



the location of the center of gravity of the aircraft while the aircraft is in flight.

4,545,020

FUEL GAGING SYSTEM

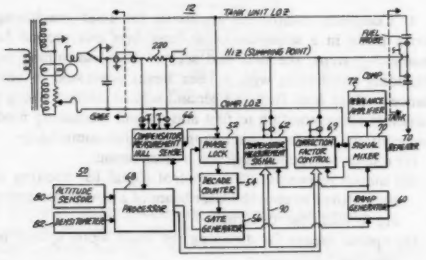
Robert G. Brasfield, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01385, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO84/01428, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1982, Ser. No. 444,241

Int. Cl.⁴ G01F *23/26*

U.S. Cl. 364—509 **14 Claims**



1. In a fuel gaging system wherein fuel quantity is determined by measuring the capacitance of a capacitive probe in the fuel tank and relating such capacitance to fuel mass by a predetermined fuel density/fuel dielectric constant relationship, the improvement comprising:

means for producing a signal K representative of the actual dielectric constant of the fuel;

means for producing a signal D_A representative of the actual density of the fuel; and

processor means for processing said K and D_A signals and determining whether said predetermined relationship is valid for the particular fuel in the tank and, if said predetermined relationship is invalid, applying a predetermined correction signal to said gaging system such that said system indicates actual fuel mass.

4,545,021

METHOD OF CORRECTING UNBALANCE OF A ROTATING BODY

Masaki Suzuki, Hirakata, and Mikio Hasegawa, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Nov. 10, 1981, Ser. No. 319,996

Claims priority, application Japan, Nov. 11, 1980, 55-159271

Int. Cl.⁴ G01M *1/38, 1/16, 1/00*

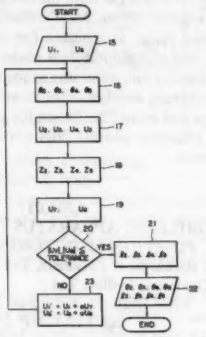
U.S. Cl. 364—571 **6 Claims**

1. A method of correcting dynamic unbalance of a rotor by either adding or subtracting corrective weights by machining the rotor in an axial direction thereof, said rotor having an unbalanced weight with respect to an axis in the axial direction, comprising:

(a) determining correcting positions and values for corrective machining weights in accordance with information relating to initial unbalanced weights in two predetermined correcting spaced apart parallel planes of the rotor, said planes being normal to the axial direction;

(b) calculating the position of the center of gravity of each of said corrective machining weights by using said determined correcting positions and said determined corrective machining weights;

(c) calculating the values of residual unbalanced weights which are located in said axial direction by using said determined correcting positions and said determined corrective machining weights;



(d) detecting whether or not one or both of said calculated residual weights is within a given range;

(e) calculating machining feed strokes respectively corresponding to said unbalanced weights only if both of said residual unbalanced weights are detected in step (d) to be within said given range;

(f) if one or both of said residual unbalanced weights is detected in step (d) to be out of said given range repeating steps (a)–(e) such that said step (a) is executed by using new values for the initial unbalanced weights, the new values being obtained from said residual unbalanced weight and said initial unbalanced weights; and

(g) machining said rotor to correct said dynamic unbalanced weights in accordance with said machining weights obtained from said step (e) and from said correcting positions obtained in step (a).

4,545,022

FRACTIONAL CALCULATOR

James T. Hughins, 4505 Cherryvale Ave., Soquel, Calif. 95073

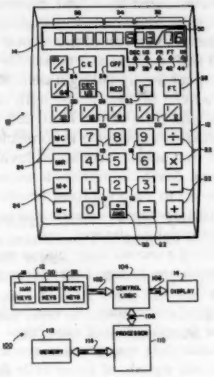
Filed Feb. 10, 1983, Ser. No. 465,500

Int. Cl.⁴ G06F *3/14, 7/38*

U.S. Cl. 364—709 **10 Claims**

1. A calculator for fractions, which comprises a keyboard including a plurality of number keys, a plurality of denominator keys having a preselected range of numbers, a plurality of function keys for selecting operations to be performed on whole numbers and fractions selected by actuation of said number keys for the whole numbers followed by actuation of a numerator function key in combination with said number keys for the numerator of the fraction and then selecting one of said preselected denominator numbers from said denominator keys, a display for showing entry of the selected numbers and fractions and results of the selected operations, and circuit means operatively connected to said keyboard and said display

for carrying out the selected operations on the selected numbers and fractions, and for displaying the selected numbers, the



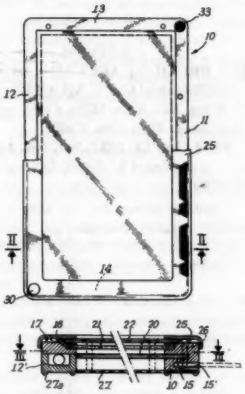
selected operation, and the results of the selected operation on said display.

4,545,023

HAND-HELD COMPUTER

Pierre M. A. Mizzi, Paris, France, assignor to Engineering Project Development Limited, London, England

Continuation of Ser. No. 320,312, Nov. 10, 1981, abandoned. This application Sep. 13, 1984, Ser. No. 649,963
Claims priority, application France, Nov. 14, 1980, 80 24306
Int. Cl.[4] G02F *1/13*
U.S. Cl. 364—709 **5 Claims**



1. A hand-held computer comprising:

a casing including a peripheral frame, an upper wall and a lower wall;

bus lines located inside said casing;

a plurality of electronic circuit cards mounted inside said casing, arranged adjacent each other and removably connected to said bus lines for performing logical operations on input data;

first and second sets of contacts formed in respective first and second electrical contact zones on an upper side of said peripheral frame and electrically connected to said bus lines;

a flat display screen mounted on said peripheral frame for data output, said display screen having edge portions engaged with said first set of contacts on said upper side of the frame for electrical connection with said bus lines;

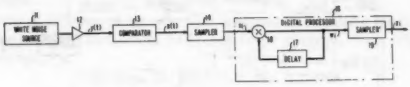
a transparent plate including a matrix of touch-sensitive areas for data input and being mounted on said peripheral frame separate from said flat display screen, said transparent plate having edge portions engaged with said second set of contacts on said upper side of the frame for electrical connection with said bus lines, said transparent plate and said flat display screen being spaced apart from each other, being respectively arranged one above the other on said peripheral frame such that said transparent plate substantially forms said upper wall of said casing.

4,545,024

HYBRID NATURAL RANDOM NUMBER GENERATOR

David P. Maher, Westboro, and Robert J. Rance, Bradford, both of Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1983, Ser. No. 489,265
Int. Cl.[4] H03K *3/84*
U.S. Cl. 364—717 **11 Claims**



1. A random signal source comprising

signal generating means for producing a nondeterministic random-like sequence of signal states occurring at a first rate, and

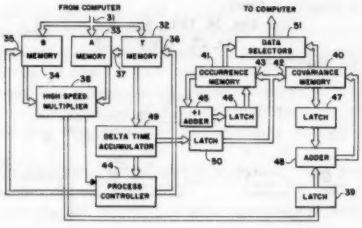
signal processing means, connected to receive the nondeterministic random-like sequence, for producing an output signal sequence having an even distribution of signal states and uncorrelated occurrences of signal states, said output sequence being produced at a second rate which is a fixed submultiple of said first rate.

4,545,025

AUTO COVARIANCE COMPUTER

Timothy E. Hepner, Gloucester, and James F. Meyers, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 16, 1983, Ser. No. 523,560
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—728 **5 Claims**



1. A hardware attachment to a computer used for computing a correlation function of random sampled data comprising:

first and second memories for storing two sets of said sampled data;

a third memory for storing the interarrival times between adjacent samples of said sampled data;

means for sequentially multiplying together all possible

combinations of the random sampled data stored in said first and second memories;

fourth and fifth memories; and

means responsive to said multiplying means and said third memory for storing in said fourth memory the multiplications made by said multiplication means in locations corresponding to the interarrival times between the data points multiplied together and for storing in said fifth memory the number of times a multiplication is stored in said fourth memory in each of said locations corresponding to an interarrival time between data points.

4,545,026

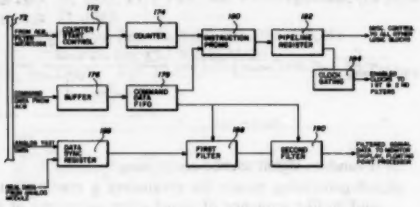
DC OFFSET FILTER

Gary P. Baggett, Arlington; Robert D. Peterson, Plano, and Wayne A. Penner, Farmers Branch, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1982, Ser. No. 418,109

Int. Cl.[4] G06F *15/31*; H03K *13/02*

U.S. Cl. 364—724 **7 Claims**



1. In a multichannel seismic data processing system where analog seismic data signals are converted to digital representations, a two-stage offset filter comprising:

a first filter stage for consistently removing dc bias due to common amplifiers from digital representations from all channels;

control means for determining the dc offset present in each digital representation due to individual channel components; and

a second filter stage connected serially to said first filter stage and controlled by said control means for removing said determined dc offset.

4,545,027

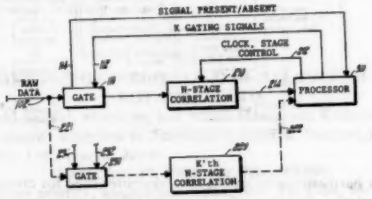
DIGITAL ADAPTIVE CORRELATING FILTER

Thomas Posluszny, Juno Isles, Fla., and Oscar Oliver, Sr., Wantagh, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1983, Ser. No. 508,631

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **4 Claims**



1. An adaptive digital correlating filter system for analyzing a train of pulses comprising:

at least two stages of sequentially connected clock-controlled correlation devices for producing a stage output signal in response to the occurrence within said pulse train of a pair of pulses within a first tolerance range, in which

a first stage correlation device comprises a first fixed-length shift register connected to a first multi-cell shift register, each cell of which multi-cell shift register produces a cell signal for correlation and an output signal to the next cell in said multi-cell shift register and means for generating a first stage output signal for signalling a coincidence between an N'th pulse at an end of said fixed-length shift register and a pulse in one of said cells of said multi-cell shift register; and

a second stage correlation device is connected to at least one output of said first stage correlation device, which second stage correlation device comprises a second multi-cell shift register connected to a second fixed-length shift register, the order of connection being opposite for said first stage and second stage correlation devices; and

means for generating a second stage output signal for signalling a two-fold correlation in said first and second stages;

characterized in that:

said first and second correlation devices include first and second means for length control connected to said first and second multi-cell shift registers for rendering inactive sequentially the cell signals of those cells furthest from said first and second fixed-length shift registers, whereby the effective length of said first and second stage correlation devices may be controlled;

said clock has a variable clock repetition rate set initially to a value corresponding to an expected signal in said train of pulses; and

said filter system further includes processing means connected to said at least two stages of correlation devices and to said clock, which processing means adaptively controls said effective lengths of said at least two stages of correlation devices and said variable clock repetition rate to adjust a tolerance parameter of said correlation devices from a predetermined loose tolerance for signal acquisition to a second, tighter, operating tolerance for efficient signal discrimination.

4,545,028

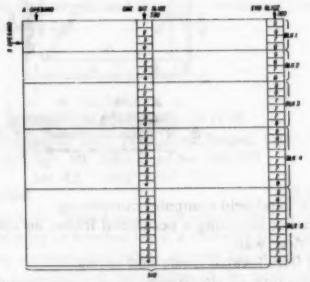
PARTIAL PRODUCT ACCUMULATION IN HIGH PERFORMANCE MULTIPLIERS

Frederick A. Ware, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 13, 1982, Ser. No. 434,298

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—760 **13 Claims**



11. A circuit for accumulating partial products in a multiplier of first and second multiple-bit operands, said accumulator circuit comprising:

a plurality of blocks of ripple cells coupled to the first and second multiple-bit operands, each of said plurality of blocks arranged as

one row of first ripple cells,

one row of second ripple cells coupled to the one row of first ripple cells,

at least one row of third ripple cells, the first of said at least one row of ripple cells coupled to the one row of second ripple cells and subsequent ones of the rows of third ripple cells coupled to the next preceding row of third ripple cells, and

one row of fourth ripple cells coupled to the last of the at least one row of third ripple cells, to provide local ripple signals between each row of ripple cells within each block and to provide global ripple signals between each of the plurality of blocks.

4,545,029

REMOTE CORRELATION OF SEQUENCE OF EVENTS

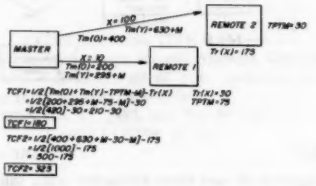
John E. Collier, Green Lane, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Continuation of Ser. No. 301,349, Sep. 11, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,431

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—900 **2 Claims**



1. In a digital data acquisition system having a master station connected to a plurality of remote stations from which are gathered information as to time of occurrence, time tags, of certain events as obtained by reference to unsynchronized clocks at associated remote stations, a method for correcting a time tag so that it refers to a time as kept by a master clock at the said master station, to make possible a time ordering of events at different remote stations, comprising the steps of:

transmitting from said master station to said remote stations inerrogatory messages requesting information on time tagged events at said remote stations;

storing at said master station a first signal representing a master clock time, Tm(O), when the end of the interrogatory message is sent by said master station;

producing at each interrogated remote station a second signal representing remote clock time, Tr(X), when the end of the interrogatory message was received at the remote station;

producing at each of said remote stations a third signal which constitutes a reply message incorporating the time tag for the events information requested and said time Tr(X);

storing at the master station a fourth signal for each interrogated remote station representing a master clock time, Tm(Y), when the end of the reply message is received at said master station;

combining at the master said first, third, and fourth signals associated with each remote station to produce a fifth signal for each remote station representing a time correction factor, TCF, for each event indicative of the difference between the time of said master clock and the time of a corresponding remote clock with compensation for signal transmission time between said master station and said corresponding remote station, said combination being in accordance with an equation

$$TCF = \frac{1}{2}[Tm(O) + Tm(Y) -]Tr(X);$$

summing for each event said fifth signal and that part of the third signal representing the time tag to produce a sixth signal for each event representing a correct timing of the event with reference to the master clock; and

recording at said master station said sixth signal for each event to provide a basis for time ordering a sequence of said events from said plurality of remote stations having unsynchronized clocks.

4,545,030

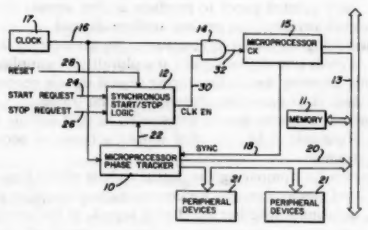
SYNCHRONOUS CLOCK STOPPER FOR MICROPROCESSOR

David A. Kitchin, Seabrook, Md., assignor to The John Hopkins University, Baltimore, Md. and Intec Systems, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1982, Ser. No. 425,668

Int. Cl.[4] G06F *1/04*

U.S. Cl. 364—900 **4 Claims**



1. A clocking control circuit for receiving an external start request signal for a microprocessor system including a microprocessor that is responsive to clocking pulses for processing instructions in a plurality of successive stages in each instruction cycle, said microprocessor having input/output data and address lines, said clocking control circuit comprising:

a clock source for generating clocking pulses,

phase tracking means coupled to said input/output data and address lines, said phase tracking means made operative by said clocking pulses for producing a phase pulse signal at a predetermined phase in each instruction cycle of said microprocessor, said predetermined phase of said phase tracking means occurrring when said input/output data and address lines of said microprocessor are operating at high impedance;

means for generating a start signal based upon said external start request signal;

receiving means for receiving a stop request signal from said microprocessor system, said stop request signal being generated when said microprocessor completes an instruction sequence; and

synchronous logic means responsive to said phase pulse signal and said stop request for preventing the transfer of said clocking pulses from said clock source to said microprocessor, and responsive to said phase pulse signal and said start signal for permitting the transfer of said clocking pulses from said clock source to said microprocessor.

4,545,031
PHOTO-ELECTRIC APPARATUS FOR MONITORING PRINTED PAPERS

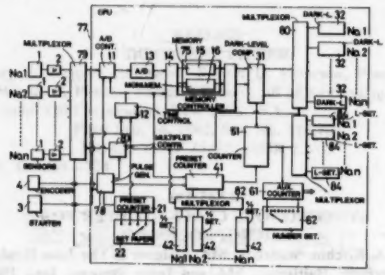
Nobuki Kobayashi, Tokyo, Japan, assignor to Kita Electrics Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,282

Claims priority, application Japan, Sep. 17, 1981, 56-145551; Sep. 17, 1981, 56-145552; Dec. 7, 1981, 56-195548; Feb. 16, 1982, 57-22033

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—900 **12 Claims**



1. An apparatus for automatically monitoring plural sheets of printed papers, comprising:

a plurality of photosensors for detecting a printed surface of each printed paper to produce analog signals designating dark levels of the printed surface thereof;

an analog-digital (A-D) converter for converting the analog signals into digital signals at a plurality of sampling points;

first memory means for storing digital signals received from said A-D converter during first time frames;

second memory means for storing digital signals received from said A-D converter during subsequent second time frames;

means for comparing the digital signals of the first and second memory means, for corresponding sampling points, to determine whether the digital signals of the second memory means are within a tolerance range of the digital signals established in the first memory means so that either "NO" signals or "YES" signals are produced;

means counting only the "NO" signals of different positions of the printed surface for producing only "irregular" or "non-identity" signals after a predetermined number of "NO" signals has been received; and

means for compensating errors which occur while producing said digital NO signals due to displacement of the paper from a standard position while said paper is monitored by said photosensors.

4,545,032
METHOD AND APPARATUS FOR CHARACTER CODE COMPRESSION AND EXPANSION

Stephen M. Mak, Pacific Palisades, Calif., assignor to Iodata, Inc., Marina Del Rey, Calif.

Filed Mar. 8, 1982, Ser. No. 355,708

Int. Cl.⁴ G11B *13/00;* **G06F** *5/00*

U.S. Cl. 364—900 **8 Claims**

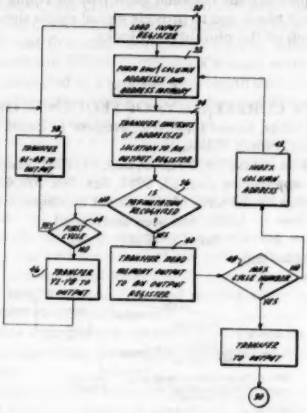
2. A method for expansion of compressed character codes comprising the steps of:

storing an input character code of fixed bit length contingently indicative of a permutation of character symbols in a register, said character codes having an arbitrary format and being user independent in that said character code is specific to a memory and independent of a user of said memory;

directly addressing a first section of a memory with a first row address, said first row address being at least a portion of said input character code stored in said register and directly addressing said first portion of said memory with a first column address, said first column address being a second bit segment of said input character code;

reading from a first location of fixed bit length in said first section of said memory into a first output register;

directly addressing a second section of said memory with said first row address and with a second column address, said second column address being in part at least a second



bit segment of said input character code, said first and second column addresses being distinct; and

reading from a second location of fixed bit length in said second section of said memory into a second output register;

whereby compressed data may be expanded, and whereby the contents of said second output register is indicative of whether said input character code corresponds to a permutation of a plurality of character symbols.

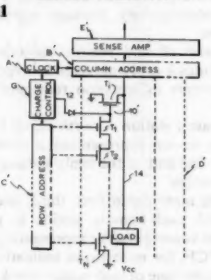
4,545,033
COMPACT ROM WITH REDUCED ACCESS TIME

Kenneth L. Naiff, Hauppauge, N.Y., assignor to General Instrument Corp., New York, N.Y.

Continuation-in-part of Ser. No. 383,709, Jun. 1, 1982, Pat. No. 4,480,320. This application Aug. 29, 1983, Ser. No. 527,087

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—51 **11 Claims**



7. Apparatus for selecting a column of memory units in accordance with column select signals comprising an output node and a decode circuit comprising three sets of four transistors each, said decode circuit being operably connected between said output node and the column of memory units, each

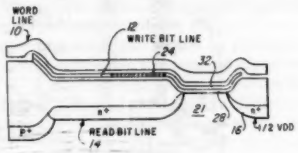
transistor in said sets comprising a control node and an output circuit, each set comprising two parallel pairs of series connected transistors, one transistor in each pair being an enhancement mode transistor and the other being a depletion mode transistor, first and second intermediate nodes, each pair of transistors in said first and second sets being operably connected between a different column and one of said intermediate nodes, each pair of transistors in said third set being connected between a different one of said intermediate nodes and said output node, one transistor in each of said pairs in each of said first and second sets being operably connected to receive a first selection signal, the other transistor in each of said pairs in each of said first and second sets being operably connected to receive a second selection signal, one transistor in each of said pairs in said third set being operably connectable to receive a third selection signal and the other transistor in each of said pairs in said third set being connectable to receive a fourth selection signal.

4,545,034

CONTACTLESS TITE RAM

Pallab Chatterjee, Richardson; Hisashi Shichijo, Garland, and John E. Leiss, Carrollton, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 17, 1983, Ser. No. 505,157
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—182 **6 Claims**



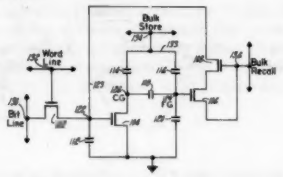
1. A memory cell comprising:
a semiconductor substrate;
a read bit line in said substrate having a second conductivity type;
a drain voltage line in said substrate having a second conductivity type;
a memory transistor channel region at the surface of said substrate, separating said read bit line from said drain voltage line;
a word line defining a gate above and capacitatively coupled to said memory transistor channel region; and
a thin polysilicon layer, said thin polysilicon layer comprising a quasi-floating gate portion thereof interposed between said word line and said channel region of said memory transistor and capacitatively coupled both to said word line and said channel region of said memory transistor, and said thin polysilicon layer also comprising a polysilicon channel region, said thin polysilicon channel region comprising a dopant concentration which is less than 10^{19} per cubic cm, said thin polysilicon channel region being capacitatively coupled to said word line, and said thin polysilicon layer also comprising a heavily doped write bit line portion, said polysilicon channel portion of said thin polysilicon layer being interposed between said write bit line portion and said quasi-floating gate portions respectively of said thin polysilicon layer, said quasi-floating gate having said second conductivity type.

4,545,035

DYNAMIC RAM WITH NONVOLATILE SHADOW MEMORY

Daniel C. Guterman, Plano, and Ching-Lin Jiang, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Jul. 20, 1982, Ser. No. 400,171
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **3 Claims**



1. A nonvolatile random access memory cell comprising:
a data input transistor controlled by address control means for reading out and writing in binary data;
a volatile storage element, having at least one node for storing binary data;
a nonvolatile storage element having at least one floating gate disposed above a tunnel oxide capacitor and coupled to said at least one node of said volatile storage element;
means for transferring binary data from at least one of said at least one node to said nonvolatile storage element; and
means for recalling binary data from said nonvolatile storage element to said volatile storage element, characterized in that:
said volatile storage element is a storage capacitor connected between a single volatile storage node at a terminal of said input transistor and ground;
said nonvolatile storage element includes a vertically stacked array of a floating gate disposed above said tunnel oxide capacitor and a floating gate transistor, a control gate, having at least one edge, disposed above said floating gate and capacitively coupled thereto with a first coupling capacitance, and a high voltage electrode for carrying high voltage in excess of 15 volts disposed above said control gate and extending in close proximity to said at least one edge, said voltage electrode being capacitively coupled to said control gate with a second coupling capacitance and capacitively coupled to said floating gate with an erase capacitance;
said means for transferring binary data includes a steering transistor connected between ground and said control gate and having a steering transistor gate connected to said volatile storage node; and
said means for recalling binary data comprises a recall transistor, having a first terminal connected to said volatile storage node, a second terminal connected to a first terminal of said floating gate transistor and a recall gate connected to a recall terminal, which recall terminal is also connected to a second terminal of said floating gate transistor.

4,545,036

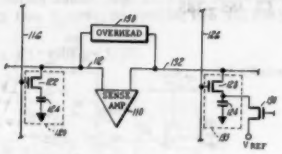
SENSE AMPLIFIER WITH TIME DEPENDENT SENSITIVITY

Dennis L. Segers, Lewisville, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Oct. 14, 1983, Ser. No. 541,926
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—189 **4 Claims**

1. An integrated circuit memory comprising:
a plurality of memory cells; and
a sense amplifier having first and second inputs, at least one of which is connectable through a bit line to at least one of said plurality of memory cells, for producing an output

dependent on an input voltage difference between a cell voltage on that one of said first and second inputs connected to a selected memory cell and a reference trip-point voltage on the other of said first and second inputs; characterized in that:



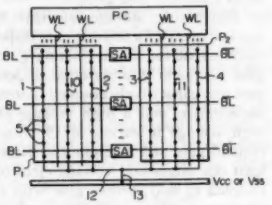
said reference trip-point voltage is controlled by time-dependent voltage control means to change over a predetermined time period from a first reference trip-point voltage after equilibration of said first and second inputs to a second reference trip-point voltage.

4,545,037

DYNAMIC SEMICONDUCTOR MEMORY DEVICE WITH BALANCED SENSING ARRANGEMENT

Tomio Nakano; Masao Nakano, both of Kawasaki, and Junji Ogawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1983, Ser. No. 508,504
Claims priority, application Japan, Jun. 28, 1982, 57-111187
Int. Cl.[4] G11C *5/06*
U.S. Cl. 365—205 **5 Claims**



5. A dynamic semiconductor memory device connected to a voltage supply line, comprising:

pairs of first and second bit lines;

word lines extending in a direction substantially perpendicular to said pairs of first and second bit lines and intersecting said first bit lines and said second bit lines;

sense amplifiers arranged in a row and having first and second sides, said pairs of first and second bit lines respectively connected to said sense amplifiers, said first bit lines extending from the first sides of said sense amplifiers and said second bit lines extending from the second sides of said sense amplifiers;

memory cells arranged at the intersections of said first and second bit lines and said word lines, each memory cell comprising a transistor and a capacitor connected to said transistor;

a first common electrode, positioned adjacent the first sides of said sense amplifiers, for commonly connecting electrodes of said capacitors of said memory cells located on said first sides of said sense amplifiers;

a second common electrode, positioned adjacent the second sides of said sense amplifiers, for commonly connecting electrodes of said capacitors of said memory cells located on the second sides of said sense amplifiers;

first wiring lines extending along said first common electrode in a direction substantially perpendicular to said first bit lines and connected to said first common electrode at a plurality of points;

second wiring lines extending along said second common electrode in a direction substantially perpendicular to said second bit lines and connected to said second common electrode at a plurality of points; and

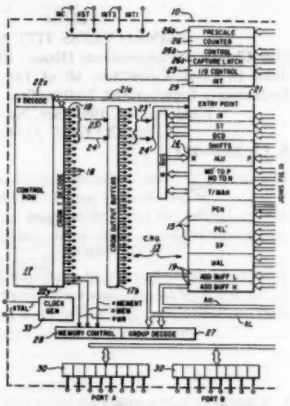
a common wiring line commonly connected to said first wiring lines and said second wiring lines, said common wiring line connected to the voltage supply line at substantially the center of said common wiring line.

4,545,038

PRECHARGED DISCHARGE SENSING FOR EPROM

Jeffrey D. Bellay, and Robert C. Thaden, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 5, 1982, Ser. No. 365,823
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—230 **4 Claims**



1. A programmable read-only memory comprising: a semiconductor substrate means for containing the programmable read-only memory, the programmable read-only memory includes:

a read-only memory array means containing a plurality of program instruction at addressable locations;

means for altering a predetermined program instruction including;

a microprocessor means for processing program instructions and to provide control signals for altering the predetermined program instruction;

address means for addressing a predetermined location in the read-only memory array means containing the program instructions to be altered;

a latch means for storing an altered program instruction and to apply the altered program instructions to the read-only memory array means at the addressed location;

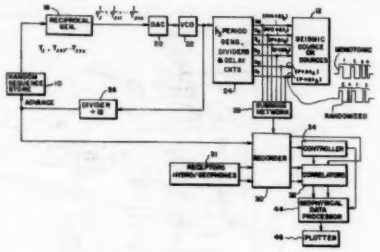
high voltage means for providing a high voltage to the address location for storing the altered program instruction in the read-only memory array means; and

output means for providing a precharge signal to the memory array means to obtain the program instructions for processing by the microprocessor means, said address means, data latch means, high voltage means and output means being controlled by the control signals.

4,545,039
METHODS FOR SEISMIC EXPLORATION

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 9, 1982, Ser. No. 416,531
Int. Cl.[4] G01V 1/00
U.S. Cl. 367—39 2 Claims



1. The method of seismic prospecting which comprises the steps of:

(a) determining a first set of numbers representing each of the signals of different durations comprising a monotonic sweep;

(b) psuedo-randomizing the sequence of the numbers to generate and transmit a first series of sweeps of said signals, each of said sweeps substantially orthogonal to the others in which the occurrence of said signals of different durations is randomized within each sweep in accordance with the psuedorandomized sequence of numbers;

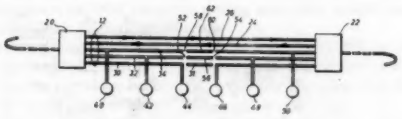
(c) receiving said first series of sweeps of signals after passage thereof through a medium; and

(d) thereafter processing the signals to produce a seismogram by cross correlating the received signals with replicas of one or more selected subsets of each of the sweeps as transmitted whereby the effective duration and shot point spacing shown by the seismogram may be selected during processing by selection of a desired subset from the first series of sweeps.

4,545,040
TELEMETRY SYSTEM CABLE

William Fehrenkamp, and Joe P. Jameson, both of Houston, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Filed Oct. 14, 1982, Ser. No. 434,292
Int. Cl.[4] G01V 1/22; G01D 5/12
U.S. Cl. 367—76 2 Claims



2. In a telemetry system cable for connection between first and second array teminals (ATs) spaced apart a distance D, said cable extending between said ATs and including X number of signal transmission means of equal length wherein X is a positive integer equal to two or more, the improvement comprising

a plurality of signal transducer means connected to said cable at 2X locations at distances apart substantially equal to D/2X,

a pair of said transducer means being connected to each one of the X transmissions means and positioned thereon substantially symmetrically relative to the ends of the cable, whereby the transducer means of the innermost pair between said ATs are substantially symmetrical relative to the center of the cable,

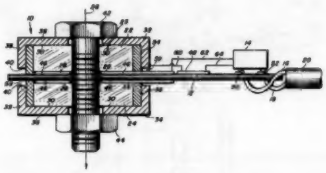
the transmission means associated with said innermost pair of transducer means being cut immediately adjacent the connection of each transducer means on the side thereof nearest the center of the cable,

the remainder of said transmission means also being cut at the same positions as the transmission means associated with the innermost pair of transducer means, so that the portions of the transmission means that have been cut from their respective transmission means all are of equal lengths, whereby the portions of the transmission means connected to the ATs have substantially equal capacitances.

4,545,041
SHOCK-HARDENED HYDROPHONE

Allan C. Tims, and Theodore A. Henriquez, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 27, 1982, Ser. No. 437,083
Int. Cl.[4] H04R 17/00
U.S. Cl. 367—157 14 Claims



1. A shock-hardened hydrophone comprising:

a pair of piezoelectric disks, each with a first surface and a second surface, for generating a potential difference between said first and second surfaces in response to an acoustic wave, where the sign of the potential difference between the first and second surface of each disk is the same;

a circuitboard with an upper surface, a lower surface, and a preamplifier circuit pattern disposed thereon, where said circuit pattern includes a first electrode with a section disposed on the upper surface and another section disposed on the lower surface and a second electrode disposed on either surface of the circuitboard;

a pair of metal cups, each metal cup with a base, a side, and a rim, where each disk is positioned within one of said cups with its second surface in pressure contact with the base of said cup so that said metal cup is in electrical contact with said second surface of said disk and at the same electric potential as said second surface;

means for applying a prestressing force to clamp said metal cups together with the disks captured therebetween, said force applying means clamping the disks with a sufficient force to mechanically preload said disks to shock harden the disks due to the mechanical stress caused by the force exerted by said force applying means, wherein the first surface of one of said disks is in pressure contact with the section of the first electrode disposed on the lower surface of said circuitboard and the first surface of the other of said disks in pressure contact with the section of the first electrode disposed on the upper surface of said circuitboard so that said first electrode is electrically connected to the first surfaces of said disks and so that the first electrode is at the same electric potential as said first surface of said disks, wherein each of the rims of said metal cups are insulated from said first electrode and said force applying means for electrically connecting said metal cups so that said metal cups are at the same electric potential;

means for electrically connecting one of said metal cups to

the second electrode of the preamplifier circuit pattern so that the second electrode is at the same electric potential as the second surfaces of said disks; and

a low output-impedance preamplifier disposed on said circuitboard with its inputs electrically connected to said first and second electrodes of said preamplifier circuit pattern.

4,545,042

METHOD FOR GENERATION OF ACOUSTIC VIBRATIONS AND SOURCE OF ACOUSTIC VIBRATIONS FOR REALIZING SAME

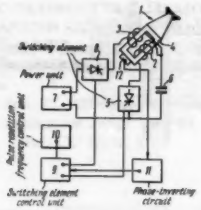
Viktor I. Fomin, Leninsky prospekt, 26, kv. 18; Stanislav I. Guzenko, Shosseinaya ulitsa, 58, korpus 2, kv. 51; Mikhail N. Egai, ulitsa Udaltsova, 16, kv. 157, all of Moscow, and Jury A. Manenkov, ulitsa Ivana Franko, 16, kv. 4, Cheboxary, all of U.S.S.R.

PCT No. PCT/SU81/00013, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02682, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 2, 1981, Ser. No. 432,937

Int. Cl.[4] G01V *1/38*

U.S. Cl. 367—189 **2 Claims**



1. A method of generating acoustic vibrations based on the shock excitation of a loaded magnetostriction transducer by a pulse electrical signal comprising the steps of:

determining the period P of acoustic vibrations by the loaded transducer and frequency f_1 thereof generated by the loaded transducer;

producing unidirectional half-cycles of cosinusoidal voltage excitation pulses having a duration d from one to two half-cycles of said period P of acoustic vibrations ($\frac{1}{2}P<d\leqq P$) and having a repetition frequency f_v which is a multiple n of the acoustic vibration frequency($nf_v=f_1$); and

applying said excitation pulses to said transducer and converting said excitation pulses into a magnetization pulse in said transducer such that said magnetization pulse has a duration and frequency substantially equal to the duration and frequency of said excitation pulses.

4,545,043

ANNOUNCEMENT SYSTEM MESSAGE PLAYBACK ARRANGEMENT

Thomas W. Anderson; Richard J. Milczarek, both of Warrenville, and Carl H. Peters, Lisle, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 21, 1982, Ser. No. 380,511

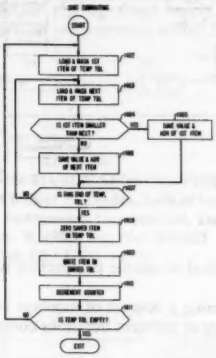
Int. Cl.[4] G11B *17/22, 7/00, 21/08;* H04M *11/00*

U.S. Cl. 369—32 **11 Claims**

1. In an announcement system comprising a store having a plurality of memory sectors for storing prerecorded messages, a reading head and means responsive to requests for the playback of messages for moving the reading head to selected sectors to read the contents therof, a method for playing back messages comprising the steps of:

accumulating in real time requests for the playback of a plurality of first messages and establishing a first rank order of the sectors associated therewith prior to reading the associated sectors to minimize the head travel when the reading head is to be moved in a forward direction to the sectors associated with the first messages,

reading according to the first rank order the contents of the sectors associated with the first messages while accumulating in real time requests for the playback of a plurality of second messages,



establishing a second rank order of the sectors associated with the second messages prior to reading the sectors associated with the second messages to minimize the head travel when the reading head is to be moved in a reverse direction to the sectors associated with the second messages, and

reading according to the second rank order the sectors associated with the second messages.

4,545,044

METHOD AND APPARATUS FOR OPTICALLY RECORDING AND REPRODUCING INFORMATION

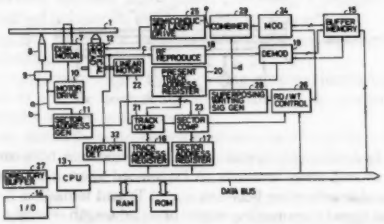
Isao Satoh, Neyagawa; Tomio Yoshida, Katano; Shunji Ohara, Osaka, and Kenji Koishi, Suita, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Aug. 16, 1982, Ser. No. 408,698

Claims priority, application Japan, Aug. 18, 1981, 56-128939

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—32 **14 Claims**



10. A method for simulating erasure of optically encoded information on an optical disc comprising the steps of:

(a) preventing readout of the information to be erased by application of a modulated laser light beam in superposition with data encoded on said disc, and

(b) updating a directory on said optical disc identifying the erased information to identify instead any renewed information representative thereof.

4,545,045

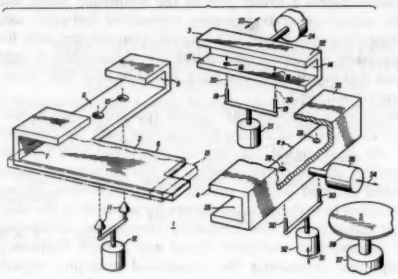
RECORDING DISK LOAD AND UNLOAD APPARATUS

James R. Baer, Broomfield; Kenneth Manes, Lafayette, and Harold Lunka, Broomfield, all of Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed May 31, 1983, Ser. No. 499,750

Int. Cl.[4] G11B *3/36, 17/04*

U.S. Cl. 369—77.2 **3 Claims**



1. An apparatus for loading and unloading a recording disk cartridge in an information storage and retrieval device, the disk cartridge having a cartridge housing and a cartridge insert, having an exterior portion, for supporting the disk when located in the disk cartridge, the cartridge insert slidably disposed within the cartridge housing and having a hole for passage of an elevator platform for lifting the disk out of the cartridge insert during loading, said loading and unloading apparatus comprising:

a guide frame for supporting and guiding a disk cartridge as the disk cartridge is loaded and unloaded in the information storage and retrieval device, said guide frame comprising:

a first leg disposed adjacent to a manual entrance port of the information storage and retrieval device, the first leg having an opening to receive and support the disk cartridge upon the manual introduction of the disk cartridge into the entrance port, and

a second leg for supporting the disk cartridge as the disk cartridge is automatically drawn into the device;

means for automatically pulling the disk cartridge into the information storage and retrieval device during loading and pushing the disk cartridge out of the information storage and retrieval device during unloading, said means comprising:

a cartridge pull-in tray having upper and lower arms for receiving an innermost edge of the cartridge housing, the cartridge pull-in tray, when in a forward position and upon the manual introduction of the disk cartridge, receives the innermost edge of the cartridge housing and supports the disk cartridge during automatic loading and unloading operations;

clamping pins disposed in holes in the lower arm of the cartridge pull-in tray, the clamping pins selectively clamping the cartridge housing between the clamping pins and the upper arm of the cartridge pull-in tray; and

means for selectively and reciprocatively urging the clamping pins upward to clamp the cartridge housing and down to unclamp the cartridge housing;

means for automatically moving the cartridge insert in a lateral direction out of the cartridge housing, said means comprising:

means for clamping the exterior portion of the cartridge insert; and

means for moving the cartridge insert out of the cartridge housing during the loading operation, and pushing the cartridge insert into the cartridge housing during the unloading operation; and

an elevator assembly, for vertically raising the disk from the cartridge insert during the loading operation and lowering the disk into the cartridge insert during the unloading operation, the elevator assembly having a platform which supports the disk when raised out of the cartridge insert, and the elevator assembly having moving means which selectively raises the platform during the loading operation and lowers the platform during the unloading operation.

4,545,046

OPTICAL RECORDING AND/OR READING DEVICE WITH SPINDLE AND OPTICAL ELEMENTS SUPPORTED ON PARALLEL BARS

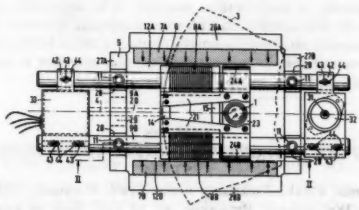
Gerardus L. M. Jansen, and Alexander Vorspaget, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 471,971

Claims priority, application Netherlands, Jan. 14, 1983, 8300133

Int. Cl.[4] G11B *7/08, 21/02*

U.S. Cl. 369—111 **2 Claims**



1. Apparatus for recording and/or reading information on a disc by means of a radiation beam, which disc is rotatable about an axis of rotation, which apparatus comprises:

a stationary frame,

a drive means for the rotary drive of the disc, which drive means comprises a drive spindle which is rotatable about said axis of rotation and a stationary spindle support system provided with bearing means for the drive spindle,

a slide which is movable in a radial direction relative to said axis of rotation,

a parallel-guide arrangement for the slide, which arrangement comprises two parallel guides which are detachably secured to the frame at some distance from each other and,

an opto-electronic system stationarily arranged with respect to said parallel guides comprising a light source, one or more optical elements, and means for effecting a conversion between optical and electrical modulation of the information,

at least one of said systems being supported by the two parallel guides, and being provided with locating stops which cooperate with the guides for an accurate positioning.

4,545,047

CENTERING DEVICE FOR INTERCHANGEABLE DISK

David W. Rickert, Boulder, Colo., assignor to Storage Technology Partners II, Louisville, Colo.

Filed Jan. 31, 1984, Ser. No. 575,416

Int. Cl.[4] G11B *3/70, 5/82*

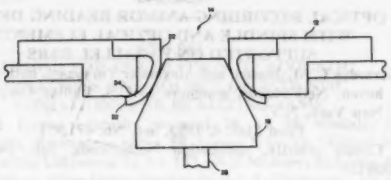
U.S. Cl. 369—290 **3 Claims**

1. Apparatus for centering a member on a rotating spindle comprising:

an annular member having a central hole with dimensions greater than corresponding outside dimensions of said rotating spindle on which said annular member is intended to fit, and

a plurality of resilient fingers attached to an inner surface of said central hole in said annular member, said fingers projecting into said central hole and said fingers being arc

shaped with the curve of said arc being away from the center of said central hole, said fingers having a length sufficient to cause a forward portion of said fingers to contract said spindle as said annular member is first placed on said spindle and to slide along said spindle as said annular member is moved to a fully inserted position,



whereby said fingers perform a wiping action along said spindle as said annular member is brought into contact with said spindle and after said annular member is fully inserted said fingers snugly contact a clean surface of said rotating spindle so that said annular member is centered on said rotating spindle.

4,545,048

SERVICE INTEGRATED DIGITAL TRANSMISSION SYSTEM

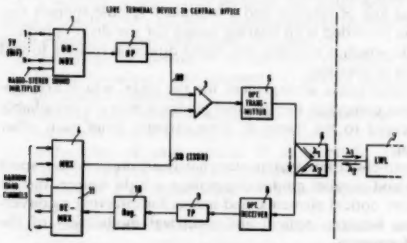
Waldemar Hauk, Backnang; Klaus Krull, Weissach, and Manfred Welzenbach, Backnang, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,188

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044657

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—1 **14 Claims**



1. In a service integrated transmission system, including a first terminal containing a transmitter, a second terminal containing a receiver, and a transmission path connecting the terminals together, for transmitting, over the transmission path, digital signals having a transmission band whose upper limit frequency corresponds to the maximum bit rate of the signals to be transmitted, the transmission being effected by simultaneously transmitting, over the transmission path, digital signals having a high bit rate only in an upper part of the transmission band and digital signals having a low bit rate only in a lower part of the transmission band, the improvement wherein:

said transmission path is a light signal transmission path;

said transmitter comprises first signal supply means for supplying a plurality of individual signals having a low bit rate as narrowband signals, second signal supply means for supplying a plurality of individual signals having a high bit rate as broadband signals, first multiplexing means connected to said first signal supply means for combining the plurality of low bit rate signals into a narrowband multiplex signal, second multiplexing means connected to said second signal supply means for combining the plurality of high bit rate signals into a broadband multiplex signal, adding means connected to said first and second multiplexing means for additively combining the narrowband and broadband multiplex signals into a combined multiplex signal having an associated frequency band in which the broadband multiplex signal occupies an upper part of the frequency band and the narrowband multiplex signal occupies a lower part of the frequency band, and light signal generating means connected between said adding means and said light signal transmission path for converting the combined multiplex signal into a light signal and conducting the light signal to said light transmission path; and

said receiver comprises light signal receiving means optically coupled to said light transmission path for converting the light signal transmitted over that path into an electrical signal, corresponding to the broadband signal formed by said adding means, signal separating means connected to said receiving means for separating the electrical signal into a low frequency component containing the narrowband multiplex signal and a high frequency component containing the broadband multiplex signal, and demultiplexing means connected to said signal separating means for separating each of the broadband and narrowband signals into a respective individual signal corresponding to those supplied by said signal supply means.

4,545,049

PRIVATE BRANCH EXCHANGE HAVING TRANSMISSION CHANNELS COMMONLY AVAILABLE TO ALL STATIONS

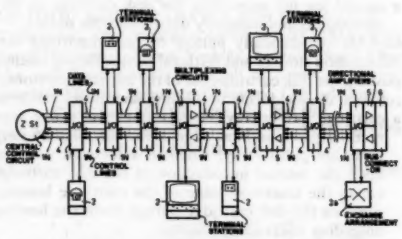
Walter Kammerer, Nürnberg, and Vladimir Spiro, Eckental, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,993

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3242958

Int. Cl.⁴ H04J *3/14*; H04Q *11/04*

U.S. Cl. 370—16 **5 Claims**



1. A telephone private branch exchange for a plurality of subscriber terminal stations (**2**), comprising:

a first group of directional data lines (**1N**) and directional control lines (**4**) for transmission in a transmit direction through the exchange;

a second group of directional data lines (**1N**) and directional control lines (**4**) for transmission in a receive direction through the exchange;

a central control circuit (**3**);

the lines in said first and second groups being connected in pairs to form respective loops including said central control circuit;

and a plurality of multiplexing circuits (**1**) respectively connecting each of said terminal stations (**2**) to each of said loops;

said control circuit (**3**) being adapted to control said multiplexing circuits (**1**) to allocate time division multiplex time

slots on the lines in said loops among all of said terminal stations (2) so that data transmission between said terminal stations may be effected in serial blocks of data in allocated time slots over any of said data lines.

4,545,050

METHOD OF AND ARRANGEMENT FOR ESTABLISHING A CONFERENCE CONNECTION IN A TDM COMMUNICATION SYSTEM

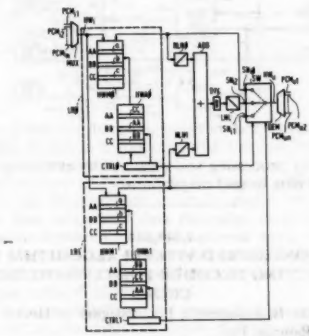
Johannes van Baardewijk; Nicolaas Bohlmeyer, and Johan E. A. Hartman, all of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,589

Claims priority, application Netherlands, Mar. 15, 1982, 8201058

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—62 **11 Claims**



1. A method for establishing conference connections among three conference participants in a TDM communication network in which a conference signal comprising the sum of the information signals supplied by the other conference participants is supplied to each of the conference participants, and in which the information signals are encoded in non-linear PCM form, characterized in that:

the information signals (a, b, c) from the participants are written into two information memories at corresponding addresses (AA, BB, CC);

the addresses (AA, BB, CC) are written into two address memories each associated with one of the information memories, the sequence in which the addresses are stored in one address memory (for example CC, AA, BB) being cyclically permuted relative to the sequence in which the addresses are stored in the other address memory (BB, CC, AA) and further relative to the sequence in which the information is stored in the two information memories (AA, BB, CC);

the information signals being stored in corresponding locations in the information memories specified by the respective address memories, and being summed to form a conference signal (c+b, a=C and b+a, respectively), the information signals being converted to a linear code prior to being summed;

dividing the conference signals by two after summation and thereafter reconverting them into non-linear PCM form;

and supplying the relevant reconverted conference signal to that conference participant who corresponds to the instantaneous address applied to said address memories (AA, BB and CC respectively).

4,545,051

SWITCHING UNIT FOR THE TRANSFER OF DIGITIZED SIGNALS IN PCM SYSTEM

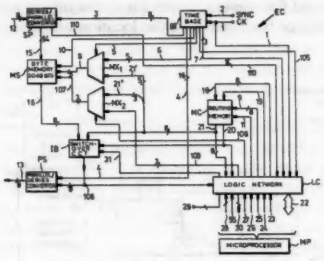
Piero Belforte; Bruno Bostica; Luciano Pilati, all of Turin; Amilcare Bovo, and Luigi Canato, both of Milan, all of Italy, assignors to Cselt Centro Studi E Laboratori, Turin, Italy

Filed Mar. 24, 1983, Ser. No. 478,467

Claims priority, application Italy, Mar. 24, 1982, 67370 A/82

Int. Cl.⁴ H04Q *11/00*; H04J *3/02*

U.S. Cl. 370—66 **6 Claims**



1. A switching unit for the selective transfer of multibit data words from a plurality of incoming signal paths, arriving simultaneously during individual time slots of a recurrent frame period assigned to respective communication channels to a like plurality of outgoing signal paths under the control of instructions from an associated command unit, comprising:

first memory means having cells for the temporary storage of all the data words arriving during one frame period over all said incoming signal paths;

timing means for controlling the loading of said cells in a predetermined order with arriving data words during each frame period in a writing phase of each time slot;

second memory means with cells for the storage of routing information identifying the cells of said first memory means whose contents are to be consecutively read out to respective outgoing signal paths during a frame period in a plurality of reading phases of each time slot;

logic means in two-way communication with said command unit for receiving said routing information therefrom and supplying same to said second memory means;

switchover means connected to an output of said first memory means and controlled by said logic means for transmitting the contents of a selected cell of said first memory means to said command unit in response to a transfer instruction received therefrom; and

multiplexer means controlled by said logic means for supplying said first memory with addresses from said timing means during writing phases and with addresses from said second memory means during reading phases, said multiplexer means being switchable under the control of said logic means in response to an extraction request from said command unit for supplying said first memory means during a reading phase with a particular address available at said logic means designating one of a plurality of channel groups, respectively assigned to said incoming signal paths, for transmission to said command unit of the contents of a cell loaded with a byte from the designated channel group.

4,545,052

DATA FORMAT CONVERTER

Herbert L. Steierman, Mountain View, Calif., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 26, 1984, Ser. No. 574,147

Int. Cl.⁴ H04J *3/00*

U.S. Cl. 370—68 **7 Claims**

1. A circuit for converting bit-interleaved data formatted in

a frame having n subframes each comprising x bits and wherein each frame consists of nx timeslots, into byte-interleaved data formatted in a frame having x channels each comprising n bits, the circuit comprising: memory means having at least one page of x locations each having at least n bits, means for generating, for each timeslot period, sequential first, second, and third timing signals, a shift register adapted to accept and output parallel and serial data and serially shift its content, means for connection to a source of said bit-interleaved data, said memory means being responsive to memory address signals and to one of said first timing signals for outputting in parallel to the shift register the content of the location corresponding to the

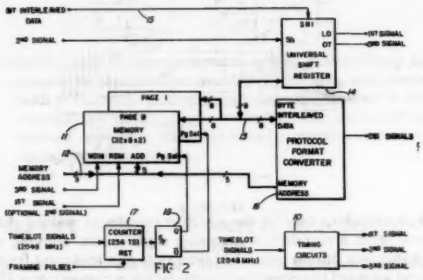


FIG 2

address signals, the location corresponding to a predetermined one of said channels, the shift register also being responsive to the first timing signal for receiving the content of the memory means location and being responsive to the second timing signal of the same timeslot period as said one of said first timing signals for shifting in serially the data bit available at said connection means and being responsive to the third timing signal of the same timeslot period as said second timing signal for outputting its contents to the memory means, and the memory means being responsive to said third timing signal for writing back into said location the content of the shift register, whereby, after nx timeslots, the page of x locations of the memory means contains a frame of byte-formatted data.

4,545,053

TIME SLOT INTERCHANGER

Jaan Raamot, Broomfield, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Mar. 21, 1984, Ser. No. 591,873
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—68 **36 Claims**

1. A time division (TD) communication switching system for controllably establishing call connections between selected ports via a time slot interchanger (TSI) wherein said TSI comprises:

an input data store for receiving call data from the ones of said ports currently serving calls,

an output data store for applying call data to the ones of said ports currently serving calls,

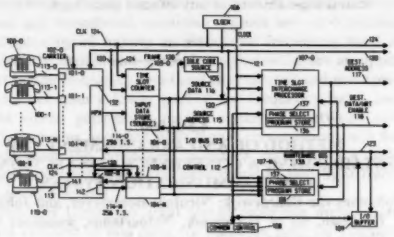
a plurality of TSI processors,

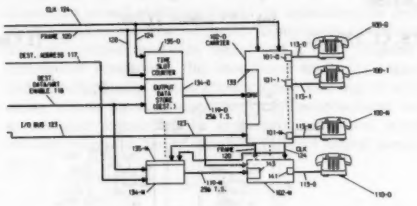
means effective on a call for extending call data from said input data store to a selected one of said TSI processors,

means in said selected TSI processor for processing said extended call data by performing specified logic operations on said call data,

means in said selected TSI processor for applying said processed data for said call to said output data store, and

means in another one of said TSI processors for concurrently serving another call between other ones of said ports by receiving data for said other call from said input





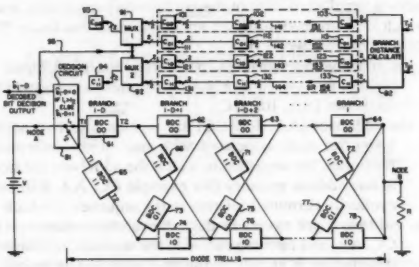
store, by processing said data, and by extending said processed data to said output store.

4,545,054

DIODE-CONFIGURED VITERBI ALGORITHM ERROR CORRECTING DECODER FOR CONVOLUTIONAL CODES

Robert C. Davis, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 9, 1983, Ser. No. 530,717
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—43 **36 Claims**



1. For use in a digital data communication system wherein information signals transmitted over a communication channel are subjected to convolutional error coding, an arrangement for decoding signals received over said channel comprising:

a plurality of circuit elements, a prescribed electrical characteristic of each of which is controllable, arranged in a prescribed pattern between first and second reference potential nodes;

means, coupled to said plurality of circuit elements, for controlling the constituency of said pattern by said circuit elements in response to signals received over said channel; and

means, coupled to the prescribed pattern in which said plu-

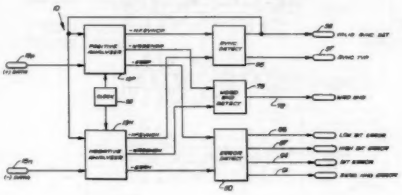
rality of circuit elements are arranged between said first and second reference potential nodes, for generating an output representative of a recovered information signal in accordance with the effective minimum distance path, through said pattern, of current flow between said first and second reference potential nodes.

4,545,055

ERROR ANALYZER FOR DATA COMMUNICATED BY BUS PROTOCOL

Jayantilal Patel, San Diego, Calif., assignor to Loral Corporation, New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 516,113
Int. Cl.[4] H04L *1/20*; G06F *11/00*
U.S. Cl. 371—55 **10 Claims**



1. In a system for detecting errors in data handled on a bus in a biphase format in accordance with a certain bus protocol, the improvement comprising:

first means for establishing (a) a first signal which goes true when said data exceeds a certain positive threshold and goes false when said data thereafter exceeds a certain negative threshold, and (b) a second signal which goes true when said data exceeds said certain negative threshold and goes false when said data thereafter exceeds said certain positive threshold, and

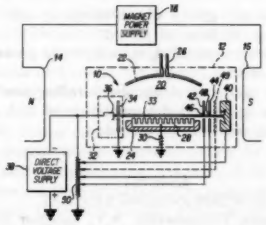
positive and negative analyzer means, cooperating with said first means, for detecting errors digitally respectively in response to the separately measured time duratons of said first and second signals.

4,545,056

DEPRESSED COLLECTOR/RIBBON ELECTRON BEAM ANALYZER FOR A DIFFRACTION RADIATION GENERATOR

Donald E. Wortman, Rockville; Clyde A. Morrison, Wheaton, and Richard P. Leavitt, Berwyn Heights, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 19, 1984, Ser. No. 622,324
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—2 **20 Claims**



1. A diffraction radiation generator comprising:

first voltage supply means for supplying a plurality of direct voltages;

beam forming means for generating a ribbon electron beam, including a cathode and an anode which are connected to receive respective direct voltages from the first voltage supply means, the anode voltage being positive relative to the cathode voltage;

beam directing means for directing the ribbon beam along a predetermined path; and

a collector assembly comprising

second voltage supply means for supplying a plurality of selected adjustable direct voltages not exceeding the anode voltage,

a collector, which is spaced from the beam forming means and is disposed in the beam path, for receiving the ribbon beam, said collector being connected to receive a selected direct voltage from the second voltage supply means which is positive relative to the cathode voltage,

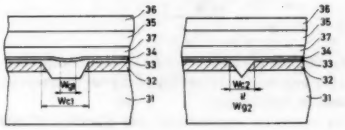
at least two electrically conductive elements disposed between the beam forming means and the collector and having respective slits disposed in the beam path to accommodate the ribbon beam directed therethrough by the beam directing means, said at least two elements including a first element which is connected to receive a selected direct voltage from the second voltage supply means which is positive relative to the cathode voltage and a second element which is disposed between the first element and the collector and which is connected to receive a selected direct voltage from the second voltage supply means which is negative relative to the first element voltage, wherein the voltage difference between the first and second element creates an electric field which acts to decelerate the electrons forming the ribbon beam in the portion of the beam path between the first element and second element and thereby minimize heating of the collector and increase the operating efficiency of the generator.

4,545,057

WINDOW STRUCTURE OF A SEMICONDUCTOR LASER

Toshiro Hayakawa, Nara; Nobuyuki Miyauchi; Takahiro Suyama, both of Tenri, and Seiki Yano, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1983, Ser. No. 486,646
Claims priority, application Japan, Aug. 30, 1982, 57-151537
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **8 Claims**



1. In a window structure semiconductor laser comprising:

a stimulated region including a crescent active layer; window regions formed at both ends of said stimulated region, each of said window regions including a plane active layer;

a cladding layer formed on one side of said crescent and plane active layers in said stimulated region and said window regions; and

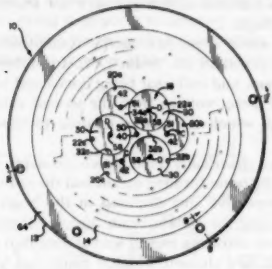
an optical guide layer formed on the other side of said crescent and plane active layers in said stimulated region and said window regions.

4,545,058

ELECTRIC FURNACE REFRACTORY ROOF FORM

Jaime F. Pozo, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 15, 1983, Ser. No. 561,661
Int. Cl.⁴ F27D *1/00*
U.S. Cl. 373—73 **6 Claims**



1. A form constructing a refractory roof for an electric furnace, said form comprising

a preformed base having a dome upper surface,

an axial recess in said upper surface defined by a plurality of arcuate edges forming a scallop periphery,

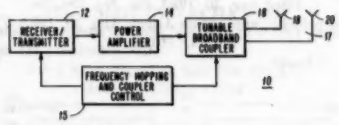
an insert replaceably seated in said recess and having angular spaced circular cut outs arranged to cooperate with selective ones of arcuate edges to define an enclosed angularly spaced recess corresponding to the electrode pattern of the furnace with which said roof is used.

4,545,059

ANTENNA COUPLER SYSTEM

R. Joe Spinks, Jr., Marion; Glenn R. Snider, and Richard E. Deasy, both of Cedar Rapids, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 27, 1984, Ser. No. 593,794
Int. Cl.⁴ H04B *12/00, 7/12*
U.S. Cl. 375—1 **13 Claims**



1. A broadband communications system comprising:

means for generating a plurality of carrier frequencies within a band of frequencies;

antenna means for transmitting said plurality of carrier frequencies;

coupler means coupled between said means for generating and said antenna means for providing a tunable impedance match over said band of frequencies and including a plurality of passbands defining said band of frequencies; and

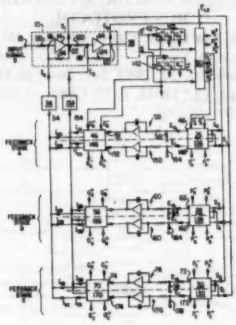
means for controlling said means for generating and said coupler means for hopping said carrier frequency within said band of frequencies and changing said passbands of said coupler means to provide an impedance match in response to said frequency hopping in such a manner that multiple frequency hops occur within a single passband before the passband of said coupler is changed.

4,545,060

DECISION FEEDBACK ADAPTIVE EQUALIZER ACTING ON ZERO STATES FOLLOWING A NON-ZERO STATE

Ephraim Arnon, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 29, 1983, Ser. No. 537,170
Int. Cl.⁴ H04B *3/12*
U.S. Cl. 375—14 **20 Claims**



12. A method of adaptively equalizing intersymbol interference in a digital communications system having decision means, for comparing a digital signal, in a bit period, with a threshold level and providing an output having either a non-zero or a zero state in dependence upon whether or not said signal exceeds the threshold, said method comprising:

summing a digital input signal and a feedback signal to provide a corrected digital signal, said corrected digital signal being applied to said decision means;

providing a gating signal indicative of the occurrence in said corrected signal of a sequence comprising a non-zero state in a first bit period and at least one zero state in later bit periods;

in response to said gating signal, sampling said corrected signal during said later bit period;

integrating such corrected signal samples to provide a control signal; and

in response to said control signal controlling said feedback signal so as to reduce the amplitude of said corrected signal during said later bit period.

4,545,061

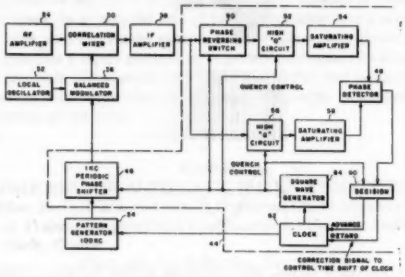
SYNCHRONIZING SYSTEM

Ronald E. Hileman, Williamsville, N.Y., assignor to Sylvania Electric Products Inc., Waltham, Mass.

Filed Sep. 28, 1962, Ser. No. 226,945
Int. Cl.⁴ H04L *7/02*
U.S. Cl. 375—119 **10 Claims**

4. In a binary code pulsed carrier communication system receiver including a radio frequency energy reception circuit,

a mixer circuit connected to said reception circuit, an intermediate frequency amplifier connected to said mixer, a local oscillator, a local binary code pulse generator, a modulator, means connecting said local oscillator and pulse generator to said modulator, means connecting the output of said modulator to said mixer, and time searching means responsive to the output of said intermediate frequency amplifier for synchronizing said local pulse code with a received pulse code having the same structure as the local pulse code, apparatus for maintaining time synchronism between said two sequences which comprises the combination of: a phase-shifting circuit arranged



periodically to change the phase timing of the output of said local pulse generator, a phase detector having first and second input terminals, first and second signal paths connected between the output of said intermediate frequency amplifier and respective input terminals of said phase detector, said first signal path including a phase-reversing switch synchronized with said periodic phase-shifting circuit and a first matched filter tuned to the intermediate frequency of said mixer, said second signal path including a second matched filter also tuned to said intermediate frequency, and a control circuit operative in response to signals from said phase detector for adjusting the time position of the output of said pulse generator.

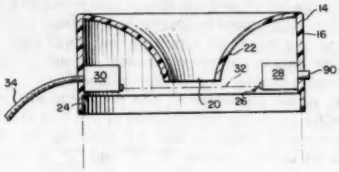
4,545,062

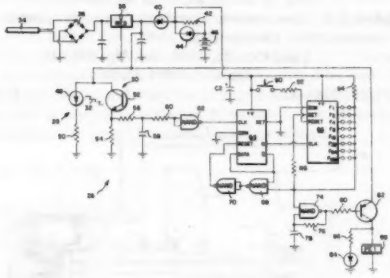
EMPTY CAN COUNTER AND LIMITER

David M. Pray, Wales, Me., assignor to Trenco, Inc., Portland, Me.

Filed Sep. 17, 1982, Ser. No. 419,579
Int. Cl.[4] H03K *21/18, 21/32, 21/36;* **B65D** *8/02*
U.S. Cl. 377—6 **9 Claims**

1. An empty can counter and limiter to receive cans having a length and diameter which is designed for use with an open top receptacle and adapted to be removably mounted on said receptacle to extend across the open top thereof comprising a unitary housing structure having sidewall means for engaging said receptacle and contoured topwall means extending from the upper extremity of said sidewall means across an area defined by said sidewall means, said topwall means having a substantially central aperture formed therein at the lowermost extremity thereof which is spaced above the lowermost extremity of said sidewall means, said topwall means being contoured to extend annularly relative to said aperture and arcuately upwardly therefrom to cause a can placed on said topwall means to assume a lengthwise position and move by gravity through said aperture, sensing means mounted on said housing and being positioned within said housing adjacent to said aperture to sense the passage of a can through said aperture and to provide an electrical output signal in response thereto, and electrical counting and indicator circuit means mounted within said housing and operative in response to said electrical output signal to register a count, and reset circuit means operative to





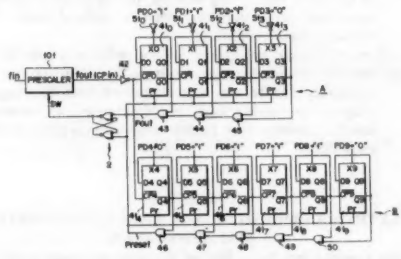
reset said electrical counting and indicator means only upon the registration thereby of a predetermined count.

4,545,063

PROGRAMMABLE COUNTER SYSTEM

Nobuyuki Kamimaru, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 497,136
Claims priority, application Japan, May 31, 1982, 57-92903
Int. Cl.[4] H03K *21/36*
U.S. Cl. 377—52 **6 Claims**



1. A programmable counter system comprising:

a prescaler for frequency dividing an input signal by a selected one of frequency division factors "$2^n - 1$" and "2^n";

programmable counter means comprising first and second programmable counters connected to said prescaler, said first and second programmable counters receiving and counting an output signal of said prescaler and comprising an output terminal and preset terminals for receiving program data inputs;

first division number means for supplying a plurality of binary bits as lower digit bits of program data,

second division number means for supplying upper digit bits of program data;

first setting means for supplying the complement of said lower digit bits of program data to said preset terminals of said first programmable counter as a division number;

second setting means for supplying said upper digit bits of program data to said preset terminals of said second programmable counter as a division number; and

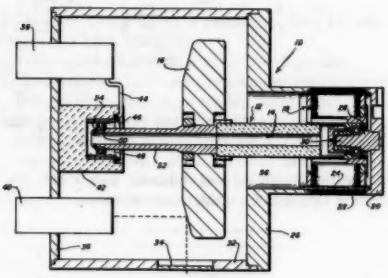
selecting means connected to said programmable counter means for receiving output signals of said first and second programmable counters, and for selecting one of said frequency division factors "2^n-1" and "2^n" according to output signals of said first and second programmable counters.

4,545,064

X-RAY TUBE ROTOR MOUNTING

Heinrich F. Klostermann, Trumbull, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 28, 1983, Ser. No. 546,616
Int. Cl.⁴ H01J *35/04*
U.S. Cl. 378—132 **11 Claims**



7. In an x-ray tube of the type having a bearing-mounted rotating anode assembly contained within a vacuum-tight envelope, the improvement comprising:

(a) a hollow-central bore projecting entirely through said anode assembly,

(b) rotatable fastening means axially driving against one end of an anode supporting bearing and adapted to be rotated by a tool projecting through said central bore of said rotating anode assembly; and

(c) a cylindrical projection coaxial with said central bore, secured to said envelope, having a shoulder to receive and positively locate the other end of said bearing, and adapted to receive said fastening means to secure said anode assembly from further axial motion relative to said envelope.

4,545,065

EXTREMA CODING SIGNAL PROCESSING METHOD AND APPARATUS

Arie Visser, Canterbury, United Kingdom, assignor to XSI General Partnership, Washington, D.C.

Filed Apr. 28, 1982, Ser. No. 372,538
Int. Cl.⁴ G10L *1/00*
U.S. Cl. 381—41 **39 Claims**

1. An apparatus for processing an analog signal comprising:

(a) means for detecting the times of occurrence of minimum and maximum values of said signal, thereby producing a detected signal;

(b) means for providing substantially random noise to said signal or said detected signal, said noise being superimposed thereon and having a broadband spectrum having frequencies in a frequency range substantially higher than the highest frequency in said analog signal, said noise being one of injected or naturally present in said signal or detected signal; and

(c) means coupled to said means for detecting for encoding only said times of occurrence of minimum and maximum values of said analog signal in the presence of said noise as

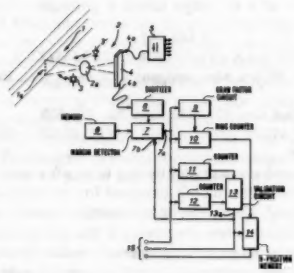
an encoded signal, said encoding means having a bandwidth greater than the bandwidth of said analog signal, said encoded signal containing information sufficient to enable substantial reproduction of said analog signal therefrom.

4,545,066

METHOD AND DEVICE FOR READING MATRIX PRINTING TEXT

Jean-Paul Gascuel, 6 rue du Val-de-Grâce, 75005 Paris, and Jacques Rivaillier, 26 rue Mars, 78470 Saint-Remy-les-Chevreuses Cressely, both of France

Filed Mar. 24, 1983, Ser. No. 478,580
Claims priority, application France, Apr. 8, 1982, 82 06210
Int. Cl.⁴ G06K *9/18*
U.S. Cl. 382—11 **7 Claims**



1. A method of reading a text printed by a matrix printhead and defining along the length of a line a succession of character bodies, each comprising a plurality of circular point locations aligned transversely to said line, and wherein at leat a first printed body has a fixed key structure, comprising; electro-optically scanning an area of line longitudinally and transversely at respective frequencies which are logically related to one another, said line area being scanned by elementary grains spaced by one step, the number of steps per location diameter defining a grain factor, said transverse scanning being carried out on a column comprising a multiplicity of grains, said column having a length comprising a body length plus an upper

and lower registration margin, and said longitudinal scanning being carried out between adjacent transverse scans, converting the signal resulting from such scanning to digital form having "1" and "0" states corresponding respectively to the presence and absence of printed text in the corresponding grain, to form a succession of multiple-state blocks, counting the number of "1" states in each block, determining the difference between said number and the corresponding number for the preceding block, storing the preceding block when this difference becomes negative, analyzing at least a first stored block via said key structure so as to store the number of "0" states at the start of the block, to thereby determine the upper registration margin of the line, and routing subsequent states of the block, in groups the size of said grain factor into a plurality of cells, said continuing said routing for subsequent blocks so as to generate a signal comprising segments consisting of a plurality of intervals corresponding to respective bodies and locations, to thereby reproduce the signal which originally controlled the printing of the text.

4,545,067

PROCESS FOR AUTOMATIC IMAGE RECOGNITION

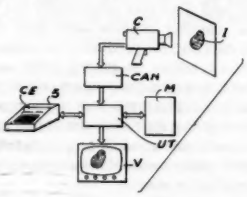
Didier Juvin, Paris, and Benoit Dupeyrat, Chilly-Mazarin, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 31, 1984, Ser. No. 575,661

Claims priority, application France, Jan. 31, 1983, 83 01447

Int. Cl.[4] G06K *9/50*

U.S. Cl. 382—21 **2 Claims**



1. A process for the automatic recognition of an image (I) on the basis of a corresponding reference image, comprising:

obtaining by optoelectronic detection means for the reference image and the image to be recognized, analog signals whose amplitudes respectively depend on the intensity levels of light rays reflected from the respective images,

digitizing the analog signals into digital values and storing the digital values in a memory,

determining for both the reference image and the image to be recognized, by means of a processing unit (UT) which receives the respective stored digital values, digital values corresponding to the coordinates of the points of at least one contour line (L) characterizing the respective images in a reference plane (XY), the values of these coordinates then being stored,

coding, by means of a reference unit (UT) receiving the digital values of the coordinates of the points of the contour line (L) for both the reference image and the image to be recognized, successive segments (Si), each having ends located on said contour line, said coded digital values being then stored at the same time as the digital values of the coordinates of the ends of the corresponding segments,

obtaining, for each segment of the contour of the image to be recognized and of the contour of the reference image and on the basis of their ends, a pair of characteristic values ρi , θi, which respectively correspond in curvilinear coordinates to the length ρi of each segment and to the angle θi formed by said segment with respect to a reference direction, wherein the characteristic values ρi, θi for the segments (Si) of the reference contour and the contour to be recognized define respective developed images (DL1, DL2),

comparing the pairs of characteristic values obtained respectively for the segments of the contour of the image to be recognized and of the contour of the reference image, wherein the comparing comprises investigating, on the basis of these pairs, coincidences between large corresponding characteristic segments of the reference contour and the contour to be recognized, wherein a large segment is defined relative to a contour as a segment which can be inscribed in a rectangle of limiting dimensions $\Delta\rho_S$, $\Delta\theta_S$, a large segment for which $\Delta\rho_S$ is larger than $\Delta\theta_S$ being said to be a rectilinear characteristic of the contour, wherein $\Delta\rho_S$ is locally the greatest length of a segment which is compatible with an angular variation $\Delta\theta_S$, a large segment for which $\Delta\theta_S$ is larger than $\Delta\rho_S$ being said to be the angle variation characteristic of the contour, wherein $\Delta\theta_S$ is locally the greatest angular variation compatible with a segment length $\Delta\rho_S$, a large segment A of the reference contour coinciding with a large segment B of the contour to be recognized for a displacement (ρ_o, θ_o), if by making the origin of the reference large segment A and the point (ρ_o, θ_o) in the large segment B coincide, the following properties are proved in curvilinear coordinates

$$\rho_A - \rho_B - \rho_o < \Delta\rho_1$$

$$\theta_A - \theta_B - \theta_o < \Delta\theta_1$$

wherein $\Delta\rho_1$ and $\Delta\theta_1$ are fixed.

4,545,068

IMAGE PROCESSING SYSTEM

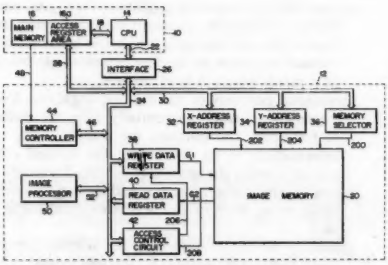
Mitsuo Tabata; Masatsugu Kidode, both of Yokohama, and Noboru Yamaguchi, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 3, 1983, Ser. No. 463,599

Claims priority, application Japan, Feb. 10, 1982, 57-18942

Int. Cl.[4] G06K *9/36;* **G06F** *15/20*

U.S. Cl. 382—41 **13 Claims**



1. An image processing system comprising:

an image memory section having an image memory for digitally storing image data, a memory controller for controlling a read/write operation of the image data with respect to said image memory, and an image processor for performing a selected type of image processing operation for the image data stored in said image memory;

a control computer having a central processing unit and a main memory connected to said central processing unit, said main memory having a predetermined size of a partial memory area, which is presecured as a special-purpose memory area for storing image data transferred between said control computer and said image memory section and is separated from the remaining memory area of said main memory;

an interface connected between said central processing unit and said image memory section;

first data bus means for connecting said central processing unit to said image memory section through said interface; and

second data bus means for directly connecting said special-purpose memory area to said image memory section and allowing said special-purpose memory area to directly store, without involving said interface, only image data randomly read out from said image memory under the control of said central processing unit, whereby said control computer is able to directly access said image memory through said second data bus means without involving said interface.

4,545,069

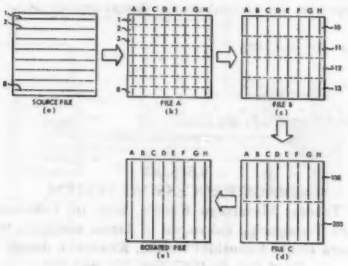
ROTATION OF DIGITAL IMAGES

Dorian Kermisch, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1983, Ser. No. 547,199

Int. Cl.⁴ G06K *9/36*

U.S. Cl. 382—46 **2 Claims**



2. In a system having a memory disc storing an image comprising an array of pixels having a first orientation, the system including a computer with buffer memory, the method of rotating the image having the first orientation including the steps of

sequentially conveying segments of the digital image into the buffer, rotating the segments and conveying the segments back to the disk memory into a first intermediate store, the rotated segments in the first intermediate being segments of n pixels where n is an integer,

conveying portions of the rotated segments from the first intermediate store sequentially into the buffer memory and rotating the portions for transfer back to a second intermediate store, combining the rotated portions back into segments, the segments having 2 n pixels,

repeating the above sequence and storing in a third intermediate store, each of the segments comprising 4 n pixels, and

repeating the above steps until the original digital image has been completely rotated to a given angle.

4,545,070

PATTERN DISCRIMINATOR

Michiaki Miyagawa, Hachiooji; Kouichi Ohki, Tokyo; Matsuhiko Takaya, Hino; Naoto Fujihara, Hino, and Tadayuki Yamada, Hino, all of Japan, assignors to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Apr. 11, 1983, Ser. No. 483,504

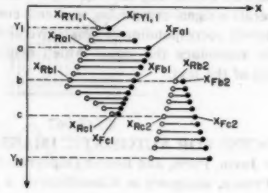
Claims priority, application Japan, Apr. 30, 1982, 57-71496; Apr. 30, 1982, 57-71497

Int. Cl.⁴ G06K *9/36*

U.S. Cl. 382—48 **4 Claims**

1. In a pattern discriminator which receives scanning data obtained by scanning objects within defined window regions with a photoelectric converter of the two-dimensional scanning type, and having means for converting the scanned data into pixel binary data representing characteristics of the object scanned by using a threshold value, and having means for evaluating the binary data in accordance with predetermined criteria and for producing an output signal indicative of said evalution, the improvement comprising:

means for defining a plurality of window regions, comprising memory means for storing adscissa data representing the beginning and ending abscissa points of each window region on each scanning line in a compressed arrangement so that the memory need only store data for scanning lines having window regions located thereon, means for generating positional data reprsenting the abscissa scanning position along each scanning line, comparator circuit



means comprising two comparators, one comparator for comparing the abscissa scanning position data with the beginning abscissa point data and for producing an output when the abscissa position is after the beginning abscissa point, and a second comparator for comparing the abscissa scanning position data with the ending abscissa point data and for producing an output when the abscissa position is before the ending point, and logic gate means generating a window output signal in response to the production of outputs from the two comparators; and

means for gating the binary data to said evaluation means in response to said window output signal, so that only binary data for points within a window region are provided to the evaluation means.

4,545,071

PORTABLE RADIO FOR A ZONED DATA COMMUNICATIONS SYSTEM COMMUNICATING MESSAGE SIGNALS BETWEEN PORTABLE RADIOS AND A HOST COMPUTER

Thomas A. Freeburg, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 441,327, Nov. 12, 1982, Pat. No. 4,481,670. This application Sep. 11, 1984, Ser. No. 649,455

Int. Cl.⁴ H04B *1/00, 7/00, 1/40*

U.S. Cl. 455—33 **2 Claims**

1. A data radio for communicating via a radio channel message signals to a host computer of a data communications system coupled to a plurality of radio receivers covering a geographical area divided into zones, said message signals including coded data packets having a binary preamble, a synchronization word and an information word containing an identification code and a command, status or data word, said radio comprising:

transmitting means coupled to one of two antennas for transmitting on the radio channel message signals applied thereto;

receiving means coupled to the two antennas for receiving message signals from the radio channel;

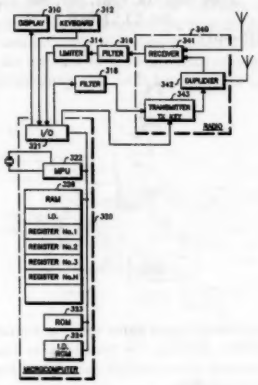
keyboard means for entering message signals;

display means for displaying data;

at least first, second and third register means for storing an identification code uniquely identifying said data radio, a first data word and a second data word, respectively; and

processing means coupled to the transmitting means, receiv-

ing means, keyboard means, display means and first, second and third register means for receiving and transmitting message signals, applying to the transmitting means message signals having information words including a data word from the second or third register means, and



receiving from the receiving means information words of received message signals and storing the command, status or data word thereof in the second or third register means when the received identification code is the same as the identification code stored in the first register means.

4,545,072

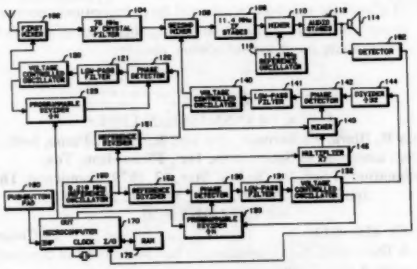
METHOD AND APPARATUS FOR ELIMINATING INTERFERENCE DUE TO SPURIOUS SIGNALS GENERATED IN SYNTHESIZED RECEIVERS

Frank R. Skutta, Palatine, and Thomas R. Klaus, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 350,966, Feb. 22, 1982, abandoned. This application Dec. 5, 1983, Ser. No. 649,170

Int. Cl.[4] **H04B** *1/26*

U.S. Cl. 455—183 **12 Claims**



10. A radio frequency (RF) signal receiver tuned to receive an RF signal from a signal source, comprising:

first multiplying means for multiplying the RF signal and a first synthesizer signal to provide a first intermediate frequency (IF) signal having one of at least two preselected intermediate frequencies;

first filtering means having a predetermined frequency passband for filtering the first IF signal, the frequency passband of the first filtering means including the two preselected intermediate frequencies of the first IF signal;

second multiplying means for multiplying the filtered first IF signal from the first filtering means and a second synthesizer signal to provide a second intermediate frequency (IF) signal having a pre-selected intermediate frequency;

second filtering means having a predetermined frequency passband for filtering the second IF signal, the frequency passband of the second filtering means being less than the frequency passband of the first filtering means;

a signal source for providing a reference signal having a predetermined frequency;

first and second synthesizing means coupled to the reference signal source and responsive to first and second control signals for generating the first and second synthesizer signals, respectively;

means for generating an input signal indicating that at least one of the first and second IF signals is modulated by a spurious signal; and

control means responsive to the input signal for generating the first and second control signals for changing the frequency of the first and second synethesizer signals to produce another of the pre-selected intermediate frequencies of the first IF signal, whereby said RF signal receiver remains tuned to receive said RF signal and the spurious signal modulation is shifted outside the passband of the second filtering means.

4,545,073

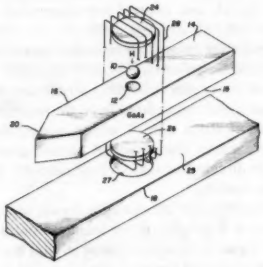
MILLIMETER WAVE IMAGE GUIDE BAND REJECT FILTER AND MIXER CIRCUIT USING THE SAME

Samuel Dixon, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 21, 1984, Ser. No. 582,193

Int. Cl.[4] **H03D** *9/02;* **H01P** *1/218*

U.S. Cl. 455—325 **14 Claims**



1. A magnetically tunable band reject filter, comprising:

a semi-insulating dielectric transmission medium including a length of a semiconductor material and a conductive ground plane supporting said semiconductor material;

a body of a high anisotropy ferromagnetic material embedded in said semiconductor material and having a ferromagnetic resonance characteristic in response to a biasing magnetic field which is operative with signals within a predetermined band of millimeter wave frequencies propagating along the semiconductor material, said signals driving said ferromagnetic material body into a coupling mode causing signal energy at said band of frequencies to be absorbed while other signal frequency energy passes substantially unattenuated; and

selectively variable magnetic field means for providing said biasing magnetic field and thereby varying the resonance frequency characteristic thereof, said magnetic field means including a pair of magnets positioned on opposite sides of said semiconductor material at the location of said ferromagnetic material, a tuning coil wound around said magnets, and a source of variable direct voltage applied

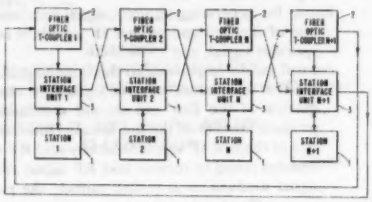
across said coil for varying the current in said coil and strength of said magnetic field.

4,545,074

FIBER OPTIC LOOP SYSTEM WITH BYPASS MODE

Layton Balliet; Richard A. Wantshouse, and Thomas J. Wylie, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1982, Ser. No. 436,166
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—601 **3 Claims**



1. A fiber optic data transmission system having at least three stations connected in a loop with each station comprising:

an optical T-coupler;

a station interface unit including a first receiver and a second receiver;

a station control logic unit having:

a decode unit connected to said first receiver and said second receiver through a signal select gate,

a receive register connected to said decode unit,

a format decode and control unit connected to said receive register,

a memory buffer connected to said format decode and control unit and also to said receive register;

said optical T-coupler providing separation of a digital optical input signal transmitted from the preceding station into two output paths one of which is directed to said first receiver within the attached station and the other of which is directed to said second receiver in the next succeeding station;

said first receiver for accepting a digital optical signal from said optical T-coupler in the attached station and converting the signal into an electronic digital signal;

said second receiver for accepting a digital signal from said optical T-coupler at the preceding station and converting the signal into an electronic digital signal;

governing means at each station for effecting normal mode or bypass mode operation dependent upon the validity of the electronic digital signal at the output of its first receiver;

said decode unit receiving bits of data in serial form from either said first receiver or from said second receiver providing a shifted bit output,

said receive register receiving and holding said shifted bit output from said decode unit until an eight bit segment called a byte, is held, said byte including an address,

said format decode and conrol unit examining said address of said byte of data in said receive register, and directing said byte of data to a particular address in said memory buffer,

said memory buffer receiving said data bytes from said receive register

said memory buffer also being able to store data generated internally in said station;

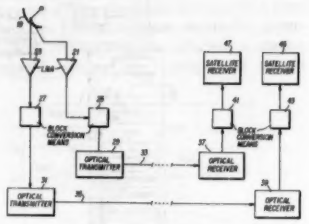
whereby data in said memory buffer contains either data received from a preceding station on said loop or data generated internally in said station.

4,545,075

SATELLITE BLOCK TRANSMISSION USING WIDEBAND FIBER OPTIC LINKS

Gary E. Miller; Mohammed F. Mesiya, both of Wallingford, and Arthur C. Deichmiller, North Branford, all of Conn., assignors to Times Fiber Communications, Inc., Wallingford, Conn.

Filed Nov. 18, 1981, Ser. No. 322,659
Int. Cl.[4] H04B 9/00
U.S. Cl. 155—612 **9 Claims**



1. A transmission system for satellite signals comprising:

(i) a satellite antenna for receiving at least one block of frequency division multiplexed signals from a telecommunications satellite;

(ii) a low noise amplifier for each block of signals received by said satellite antenna for amplifying said block of signals;

(iii) first block conversion means associated with each low noise amplifier for converting the block of electrical signals into a frequency band of 0.6–1.1 GHz;

(iv) a wideband fiber optical transmitting means connected to and driven by each first block conversion means and arranged for converting the input block of electrical signals into an analogous 0.6–1.1 GHz block of optical signals and further arranged to couple said optical signals into an appropriate transmission medium;

(v) a wideband fiber optic link connected to each optical transmitting means as the medium for transmitting the 0.6–1.1 GHz block of signals;

(vi) an optical receiving means connected to each wideband fiber optic link for receiving the transmitted 0.6–1.1 GHz block of signals and converting said signals into an analogous block of electrical signals; and

(vii) a satellite receiver connected to each optical receiving means for receiving and converting the block of signals to a frequency band for subscriber use.

4,545,076

DATA TRANSMISSION LINK

James R. Biard, Richardson, and Ben R. Elmer, Plano, both of Tex., assignors to Spectronics, Inc., Richardson, Tex.

Continuation of Ser. No. 20,204, Mar. 13, 1979, abandoned. This application Jul. 12, 1982, Ser. No. 397,575
Int. Cl.[4] H04D 9/00
U.S. Cl. 455—612 **24 Claims**

1. A fiber optic data transmission link to be used in conjunction with a first power supply and a second power supply, comprising in combination:

a transmitter powered by the first power supply for accepting conducted electrical data and transmitting optical data corresponding to the electrical data;

means for receiving optical data;

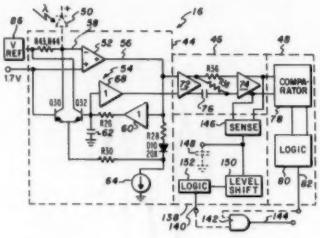
a receiver input amplifier powered by the second power supply directly connected to the means for receiving optical data for generating electrical data corresponding to received optical data;

a first current divider branch having a first end and a second end, with the first end connected to the input of the receiver input amplifier;

a second current divider branch connected to the second end of the first current divider branch;

means responsive to the output of the receiver input amplifier for controlling the amount of the combined currents of the two current divider branches;

means responsive to the average value of at least the optical data for controlling the ratio of the currents in the two current divider branches wherein the first current divider branch, the second current divider branch, the means for controlling the amount of the combined currents and the means for controlling the ratio act together to form an



automatic gain control circuit connected in a feedback relationship to the input of the receiver input amplifier;

a postamplifier for amplifying the electrical data generated by the receiver input amplifier;

at least one fiber optical data transmission cable for transmitting the optical data from the transmitter to the means for receiving optical data;

means for electrically connecting the transmitter to the first power supply; and

means for electrically connecting the receiver input amplifier and the postamplifier to the second power supply.

4,545,077

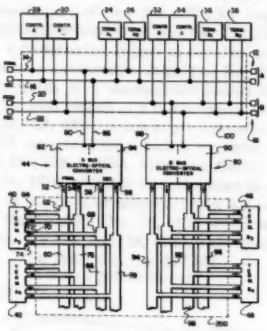
ELECTRO-OPTICAL DATA BUS

Thaddeus R. Drapala, Canyon Country, and Mohammad K. Zaman, Northridge, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Oct. 29, 1982, Ser. No. 437,650

Int. Cl.[4] G02F *1/00, 2/00;* **H04B** *9/00;* **H01S** *3/00*

U.S. Cl. 455—612 **6 Claims**



1. An electro-optical multiplex bus comprising:

an electrical bus;

a fiber optic bus comprising a receiving fiber optic cable and a transmitting fiber optic cable;

a converter module for effecting a transparent connection between said electrical bus and said fiber optic bus, said converter module comprising,

an optical input port,

an optical receiver circuit operatively coupled to said optical input port and responsive to changes in light flux thereat for applying a corresponding electrical bi-phase signal to said electrical bus,

an optical output port, and

an optical transmitter circuit operatively coupled to said output port and responsive to electrical bi-phase signals carried on said electrical bus for generating corresponding changes in light flux at said output port;

a plurality of optical terminals, each of said optical terminals having a terminal input port and a terminal output port;

means for optically coupling said transmitting cable to the respective output ports of said optical terminals and to said input port of said converter module;

means for optically coupling said receiving cable to said converter module output port and to the respective input ports of said optical terminals; and

a data bus controller for transmitting command signals to a particular one of said optical terminals via said converter module transmitter circuit and for receiving status word signals generated by said particular terminal in response to said command word signals, said status signals being transmitted to said controller via said optical receiver circuit of said converter module.

4,545,078

METHOD AND ARRANGEMENT FOR CONTROLLING A LIGHT SWITCH FOR OPTICAL SIGNALS

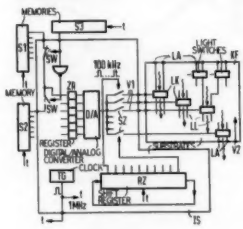
Klaus Wiedeburg, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,208

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147109; Dec. 23, 1981, 3151209; Jun. 11, 1982, 3221945

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—600 **21 Claims**



9. A method for controlling optoelectronic crosspoints of an exchange system, each of the crosspoints having light waveguides with at least closely parallel sections as intermediate lines extending through the crosspoints for carrying optical signals, each of the crosspoints comprising an optical switch manufactured in integrated technology with the light waveguides on a substrate, each of the light switches comprising electrically activatable electrodes for direct or cross switching the optical signals, comprising the steps of:

cyclically reversing the polarity of electrical fields across some of the light switches; while

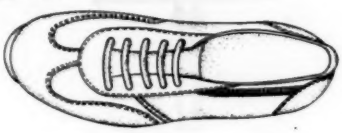
simultaneously reversing the polarity of the fields of all switches on the same substrate in response to a polarity reversal command.

DESIGNS

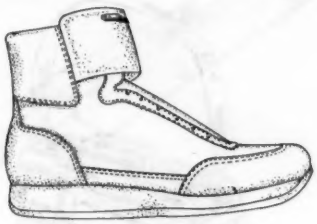
OCTOBER 1, 1985

280,775
WARM-UP SUIT OR THE LIKE
Michael O. Bisbee, 4419 Belle Terrace Apt. #B-4, Bakersfield, Calif. 93309
Filed Apr. 14, 1983, Ser. No. 465,685
Term of patent 14 years
U.S. Cl. D2—29

280,776
ATHLETIC SHOE WITH POCKET
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louid, Mo.
Continuation-in-part of Ser. No. 297,337, Aug. 28, 1981, which is a continuation-in-part of Ser. No. 297,338, Aug. 28, 1981, which is a continuation-in-part of Ser. No. 297,336, Aug. 28, 1981, which is a continuation-in-part of Ser. No. 314,134, Oct. 23, 1981, which is a continuation-in-part of Ser. No. 314,138, Oct. 23, 1981, which is a continuation-in-part of Ser. No. 314,135, Oct. 23, 1981, which is a continuation-in-part of Ser. No. 314,136, Oct. 23, 1981, which is a continuation-in-part of Ser. No. 408,650, Aug. 16, 1982, which is a continuation-in part of Ser. No. 213,251, Feb. 3, 1981, which is a division of Ser. No. 107,092, Dec. 26, 1979, which is a continuation-in-part of Ser. No. 938,098, Aug. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 107,093, Dec. 26, 1979, which is a continuation of Ser. No. 116,279, Jan. 28, 1980. This application Sep. 29, 1982, Ser. No. 427,637
Term of patent 14 years
U.S. Cl. D2—309

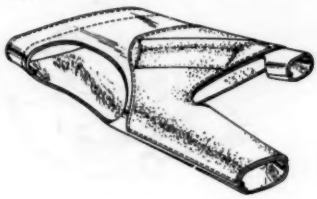


280,777
ATHLETIC SHOE WITH WRAPAROUND POCKET
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Oct. 25, 1982, Ser. No. 436,342
Term of patent 14 years
U.S. Cl. D2—310



280,778
POCKETED BOOT
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Oct. 25, 1982, Ser. No. 436,603
Term of patent 14 years
U.S. Cl. D2—310

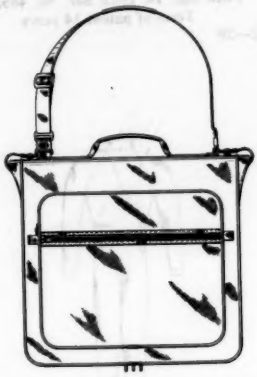
280,779
BOWLING GLOVE
Wallace H. Laws, 6000 Woodside, Kansas City, Mo. 64133
Filed May 6, 1983, Ser. No. 492,185
Term of patent 14 years
U.S. Cl. D2—361

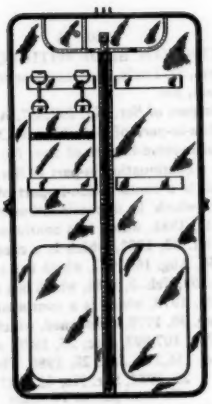


280,780
CARRYING CASE
Suzanne Thomas, South Hackensack, N.J., assignor to La Rue Distributors, Inc., So. Hackensack, N.J.
Filed Jul. 11, 1983, Ser. No. 512,176
Term of patent 14 years
U.S. Cl. D3—48

280,781
STORAGE CASE FOR BABY TEETH
Charles J. Zarganis, 916 Evergreen Way, Millbrae, Calif. 94030
Filed Apr. 6, 1983, Ser. No. 482,632
Term of patent 14 years
U.S. Cl. D3—66

280,782
GARMENT BAG
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics Ltd., New York, N.Y.
Filed Jan. 21, 1983, Ser. No. 459,886
Term of patent 14 years
U.S. Cl. D3—71

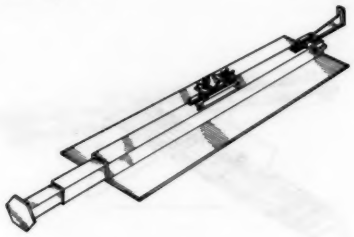




280,783
SOFT-SIDED WHEELED SUITCASE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley; Jack Barber, Cambridge, all of Mass., and John Migliore, Barrington, R.I., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 31, 1983, Ser. No. 528,034
Term of patent 14 years
U.S. Cl. D3—71

280,784
PAINTING TOOL
Joop J. deVreeze, Veendam; Zwier Tijssen, Sportlaan, both of Netherlands, and Daniel Doorley, Salem, Mass., assignors to Multigood B.V., Veendam, Netherlands
Filed Jul. 15, 1983, Ser. No. 514,221
Term of patent 14 years
U.S. Cl. D4—122

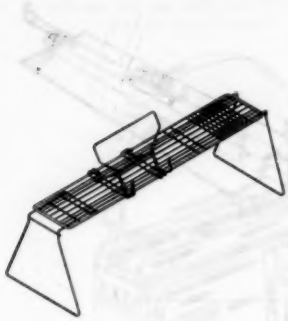
280,785
EXTENDABLE TIE RACK HOUSING WITH COVER
Charles E. Benedict, Tallahassee, Fla., assignor to Telescoping Tie Racks, Inc., Winter Haven, Fla.
Continuation-in-part of Ser. No. 453,053, Dec. 27, 1982, Pat. No. Des. 277,436. This application Oct. 12, 1984, Ser. No. 660,164
Term of patent 14 years
U.S. Cl. D6—324



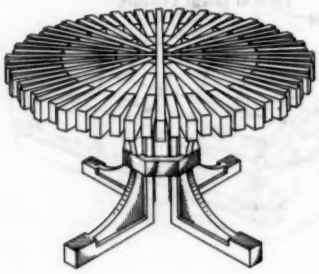
280,786
LOUNGE CHAIR
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jan. 3, 1983, Ser. No. 455,062
Term of patent 14 years
U.S. Cl. D6—366

280,787
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Aug. 24, 1983, Ser. No. 526,125
Term of patent 14 years
U.S. Cl. D6—381

280,788
COMBINED ACCESSORY TRAY AND BOOK SUPPORT FOR USE IN BATH TUBS, BEDS OR THE LIKE
Gus Levin, #302B, 4515 N. Braeswood, Houston, Tex. 77035
Filed Jul. 25, 1983, Ser. No. 517,501
Term of patent 14 years
U.S. Cl. D6—406

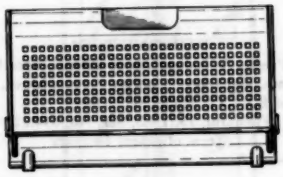


280,789
TABLE
Edwin R. Murphy, Jr., 317 Meyers Dr., Greenville, S.C. 29605
Filed Sep. 30, 1982, Ser. No. 431,809
Term of patent 14 years
U.S. Cl. D6—455

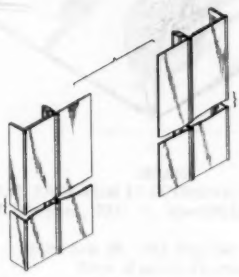


280,790
REFRIGERATED DISPLAY CASE FOR FLOWERS OR THE LIKE
Hermen Kooy, Stommeerkade 46, 1431 EW Aalsmeer, Netherlands
Filed Jul. 21, 1982, Ser. No. 400,412
Term of patent 14 years
U.S. Cl. D6—471

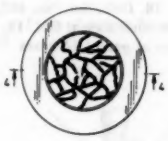
280,791
STORAGE CABINET
Andreas Dozsa Farkas, Munich, Fed. Rep. of Germany, assignor to Johannes Buchsteiner GmbH & Co. KG, Gingen/Fils, Fed. Rep. of Germany
Filed Apr. 13, 1982, Ser. No. 367,962
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, NR 1747
Term of patent 14 years
U.S. Cl. D6—559



280,792
DRAPERY MODULE UNIT FOR DOORS, WINDOWS, AND THE LIKE
Lyman N. Fairbanks, Arlington, Va., assignor to Custom Shade and Awning Corporation, Alexandria, Va.
Filed Apr. 11, 1983, Ser. No. 483,936
Term of patent 14 years
U.S. Cl. D6—575

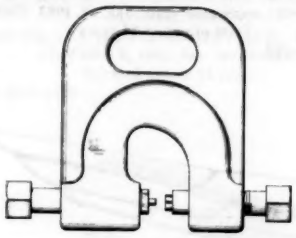


280,793
DOUGH MOLD
Ian Thornton, Flackwell Heath; Kenneth DeWitt, Reading, and Simon Robertson, West Reading, all of England, assignors to Keebler Company, Elmhurst, Ill.
Filed Aug. 2, 1982, Ser. No. 404,564
Claims priority, application United Kingdom, Feb. 2, 1982, 1004917
Term of patent 14 years
U.S. Cl. D7—43



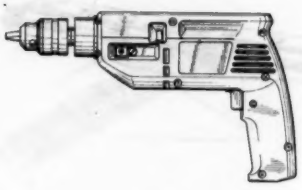
280,794
CROSS ARM FOR AN ESPALIER FRAME
Eric R. Evans, Napier, New Zealand, assignor to Ebro Espalier Limited, Ebro Orchards, Napier, New Zealand
Filed Jun. 17, 1983, Ser. No. 505,476
Claims priority, application New Zealand, Jun. 1, 1983, 18180
Term of patent 14 years
U.S. Cl. D8—1

280,795
RIVET TOOL OR SIMILAR ARTICLE
David J. Jordan, Broken Arrow, Okla., assignor to Accessory Sales, Inc., Kimball, Nebr.
Filed Aug. 27, 1982, Ser. No. 412,247
Term of patent 14 years
U.S. Cl. D8—14



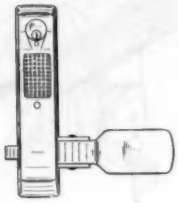
280,796
ELECTRIC HAND DRILL
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Del.
Filed Jun. 15, 1983, Ser. No. 504,412
Term of patent 14 years
U.S. Cl. D8—61

280,797
PORTABLE ELECTRIC DRILL
Masakazu Sakamoto, Chiba; Teruhisa Numata, Tokyo, and Juzaburo Monobe, Hiroshima, all of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 29, 1983, Ser. No. 566,936
Claims priority, application Japan, Jul. 26, 1983, 58-33087
Term of patent 14 years
U.S. Cl. D8—68

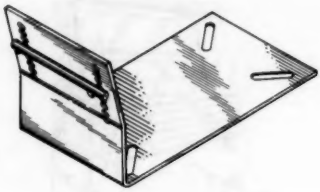


280,798
LETTER OPENER
Gianni Bulgari, Rome, Italy, assignor to Ditta Sotirio Bulgari di Constantino e Giorgia Bulgari S.a., Rome, Italy
Filed Jul. 7, 1982, Ser. No. 395,898
Claims priority, application Italy, Jun. 24, 1982, 35628/82[U]
Term of patent 14 years
U.S. Cl. D8—102

280,799
COMBINED ALARM EXIT LATCH AND LOCK THEREFOR
Richard Ohno, Branford, Conn., assignor to Kidde, Inc., New Haven, Conn.
Filed Sep. 30, 1982, Ser. No. 429,557
Term of patent 14 years
U.S. Cl. D8—302

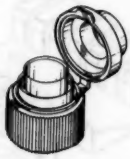


280,800
PUMP SUPPORT BRACKET FOR A JETTED WHIRLPOOL BATH
Philip E. Chalberg, 1119 Maple Ave., Orange, Calif. 92668
Filed Jan. 24, 1983, Ser. No. 460,226
Term of patent 14 years
U.S. Cl. D8—380



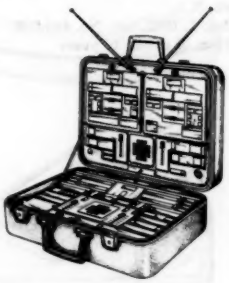
280,801
BOTTLE
Reijiro Yoshimura, New York, N.Y., assignor to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
Filed Apr. 18, 1983, Ser. No. 485,656
Claims priority, application Japan, Oct. 19, 1982, 57-47533
Term of patent 14 years
U.S. Cl. D9—367

280,802
BOTTLE CAP FOR EDIBLE OIL
Joong H. Cho, 1097-2 Myunmok-dong, Dongdaemun-Ku, Seoul, Rep. of Korea
Filed Oct. 25, 1982, Ser. No. 436,566
Term of patent 14 years
U.S. Cl. D9—446



280,803
DIAL FACE FOR ELECTRONIC TIMEPIECE
Robert T. Peterson, 3333 N. Marshfield Ave., Chicago, Ill. 60657
Filed Sep. 20, 1982, Ser. No. 419,722
Term of patent 14 years
U.S. Cl. D10—39

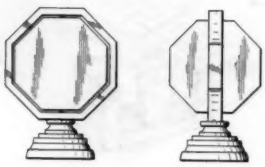
280,804
PORTABLE SELF-CONTAINED SURVEILLANCE AND DETECTION DEVICE
Sophia Hardy, and John H. G. Wilson, both of 1 London House, High St., Ripley, Surrey, GU23 6AA23, England
Filed Jun. 21, 1982, Ser. No. 390,784
Claims priority, application United Kingdom, Dec. 23, 1981, 1004341
Term of patent 14 years
U.S. Cl. D10—75



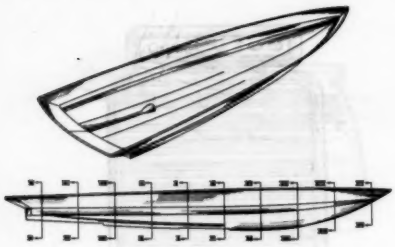
280,805
DIGITAL SCALE
Ronald L. Muller, Old Saybrook, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Jul. 1, 1983, Ser. No. 509,621
Term of patent 14 years
U.S. Cl. D10—92

280,806
DETACHABLE SIDE LUGGAGE CASE FOR MOTORCYCLE
Shin-chen Hsu, 12-1, 12th Fl., No. 2, Fu Chin St., Taipei, Taiwan
Filed Oct. 5, 1981, Ser. No. 308,896
Term of patent 14 years
U.S. Cl. D12—158

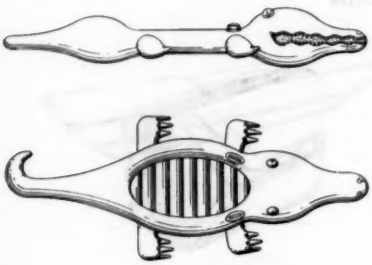
280,807
COMBINED VEHICLE ORNAMENT AND ADVERTISING DEVICE
Elmar Kaiser, 6 Route de Meyrin, 1202 Geneva, Switzerland
Filed Jun. 23, 1982, Ser. No. 365,299
Term of patent 14 years
U.S. Cl. D12—197



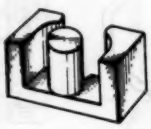
280,808
BOAT HULL
Allan B. Hegg; Lloyd S. Makowski, both of Manistee, and James S. Phares, Farmington Hills, all of Mich., assignors to Century Boat Company, Manistee, Mich.
Filed Sep. 28, 1983, Ser. No. 536,716
Term of patent 14 years
U.S. Cl. D12—314



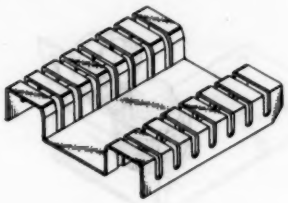
280,809
FLOAT
Henry S. Wolfe, St. Petersburg, Fla., assignor to Gulf Coast Aqua Leisure Corporation, Clearwater, Fla.
Filed Nov. 9, 1984, Ser. No. 670,919
Term of patent 14 years
U.S. Cl. D12—316



280,810
FERRITE CORE
Tadashi Mitsui, Tokyo, Japan, assignor to T.D.K. Corp., Tokyo, Japan
Filed Jun. 18, 1982, Ser. No. 389,900
Term of patent 14 years
U.S. Cl. D13—4

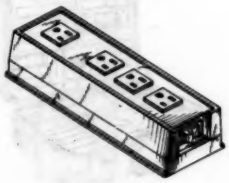


280,811
HEAT SINK OR SIMILAR ARTICLE
Marvin F. Moore, Carrollton, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.
Filed Apr. 15, 1983, Ser. No. 485,204
Term of patent 14 years
U.S. Cl. D13—23



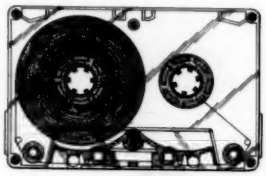
280,812
LIGHT-EMITTING DIODE SEMICONDUCTOR CHIP WITH LEADS
Kaoru Takahashi, Zama, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Nov. 3, 1982, Ser. No. 438,952
Claims priority, application Japan, May 7, 1982, 57-19712
Term of patent 14 years
U.S. Cl. D13—24

280,813
ELECTRICAL OUTLET
Harold B. Rapp, Williston Park, and Herbert Towne, Brookville, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 2, 1982, Ser. No. 446,098
Term of patent 14 years
U.S. Cl. D13—28

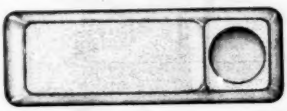


280,814
PUSH BUTTON SWITCH
Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Japan
Filed Dec. 5, 1983, Ser. No. 558,052
Claims priority, application Japan, Oct. 4, 1983, 58-043052
Term of patent 14 years
U.S. Cl. D13—38

280,815
TAPE CASSETTE
Anthony L. Gelardi; John Gelardi, both of Cape Porpoise; Vincent Landry, and Diane Pruneau, both of Saco, all of Me., assignors to Shape Inc., Biddeford, Me.
Filed Nov. 9, 1983, Ser. No. 550,177
Term of patent 14 years
U.S. Cl. D14—11

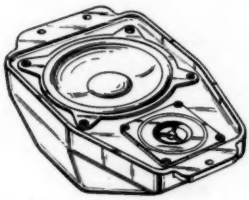


280,816
HOUSING FOR A TELEPHONE
Thomas B. Aldrich, Spring Valley; John Pardo, Yonkers, and Martin H. Snyder, New York, all of N.Y., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Jul. 19, 1984, Ser. No. 632,188
Term of patent 14 years
U.S. Cl. D14—63



280,817
LOUDSPEAKER
Tetsuo Ohtsuji, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 18, 1983, Ser. No. 495,909
Claims priority, application Japan, Nov. 19, 1982, 57-52334
Term of patent 14 years
U.S. Cl. D14—30

280,818
AUTOMOBILE AUDIO SPEAKER ENCLOSURE
William M. Clover, Jr., 26871 Ayamonte, Mission Viejo, Calif. 92692
Filed Mar. 11, 1983, Ser. No. 474,261
Term of patent 14 years
U.S. Cl. D14—34

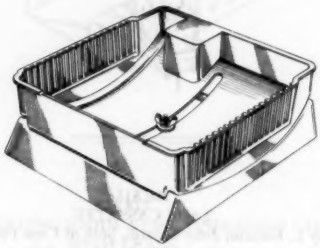


280,819
PERSONAL COMPUTER
Hiroshi Nishibori, and Kunio Akiyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 21, 1983, Ser. No. 460,119
Claims priority, application Japan, Jul. 29, 1982, 57-34805
Term of patent 14 years
U.S. Cl. D14—100

280,820
CRT WORK STATION
Robert Winters, Santa Cruz, and Farouk Arjani, Los Altos Hills, both of Calif., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed May 2, 1983, Ser. No. 490,809
Term of patent 14 years
U.S. Cl. D14—106

280,821
VIDEO DISPLAY TERMINAL
David Lekhtman, Montreal, Canada, assignor to Mitel Corporation, Kanata, Canada
Filed Feb. 28, 1983, Ser. No. 470,240
Claims priority, application Canada, Sep. 24, 1982, 24-09-82-2
Term of patent 14 years
U.S. Cl. D14—106

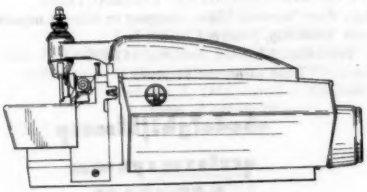
280,822
COMPUTER PEDESTAL
Thomas W. Judd, Peterborough, N.H., and Gregory F. Resker, Norwell, Mass., assignors to Curtis Manufacturing Company, Inc., Winchester, N.H.
Filed Mar. 3, 1983, Ser. No. 471,875
Term of patent 14 years
U.S. Cl. D14—114

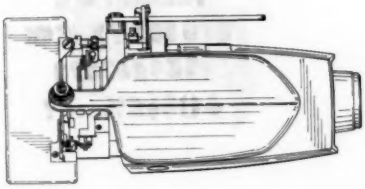


280,823
DRY BATTERY DRIVEN LIQUID PUMP
Eiki Maruyama, Nagano, Japan, assignor to Maruyama Industrial Co. Ltd., Kanago, Japan
Filed Feb. 9, 1983, Ser. No. 465,185
Term of patent 14 years
U.S. Cl. D15—7

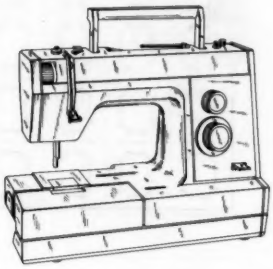
280,824
CULTIVATOR
Yoshio Mikado, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Mar. 25, 1983, Ser. No. 478,945
Claims priority, application Japan, Oct. 26, 1982, 57-48545
Term of patent 14 years
U.S. Cl. D15—12

280,825
SEWING MACHINE
Donald R. Meyer, Wilmette, Ill., assignor to Union Special Corporation, Chicago, Ill.
Filed Nov. 9, 1981, Ser. No. 319,488
Term of patent 14 years
U.S. Cl. D15—69

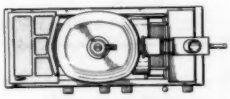


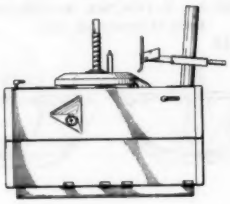


280,826
SEWING MACHINE
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Feb. 7, 1983, Ser. No. 464,732
Claims priority, application Japan, Dec. 20, 1982, 57-56675
Term of patent 14 years
U.S. Cl. D15—69

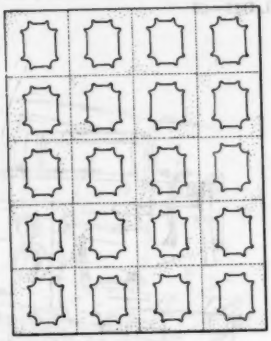


280,827
TIRE CHANGER
Christopher G. Clark, Cincinnati, Ohio, and Phillip A. Spainhour, Waukegan, Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.
Filed Dec. 19, 1983, Ser. No. 563,115
Term of patent 14 years
U.S. Cl. D15—199





280,828
MULTIPLE DENTAL X-RAY MOUNT
Milton G. Deemer, 3155 Deer Meadow Dr., Danville, Calif. 94526
Filed Jun. 24, 1983, Ser. No. 507,295
Term of patent 14 years
U.S. Cl. D16—26



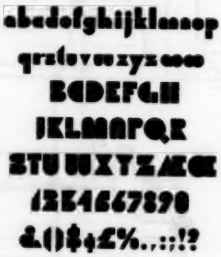
280,829
PHOTOGRAPHIC LIGHT BRACKET
Kenneth L. Rubel, 300 W. Hill, Apt. 916, Chicago, Ill. 60610
Filed Sep. 30, 1982, Ser. No. 429,439
Term of patent 14 years
U.S. Cl. D16—47

280,830
EYEGLASSES
Barton M. Levoy, 130 Cutter Mill Rd., Great Neck, N.Y. 11022
Filed Jan. 9, 1984, Ser. No. 569,285
Term of patent 14 years
U.S. Cl. D16—113

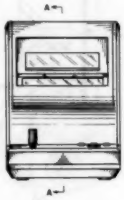
280,831
EYEGLASSES
Barton M. Levoy, 130 Cutter Mill Rd., Great Neck, N.Y. 11022
Filed Jan. 9, 1984, Ser. No. 569,328
Term of patent 14 years
U.S. Cl. D16—116

280,832
ELECTRONIC CALCULATOR OR SIMILAR ARTICLE
Kunihiko Mineta, Kawasaki, Japan, assignor to The General Corporation, Kawasaki, Japan
Filed Mar. 16, 1983, Ser. No. 475,884
Claims priority, application Japan, Aug. 7, 1982, 57-35815
Term of patent 14 years
U.S. Cl. D18—7

280,833
FONT OF ALPHANUMERIC CHARACTERS
David Thakar, West Newton, Mass., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Oct. 13, 1983, Ser. No. 541,750
Term of patent 14 years
U.S. Cl. D18—24

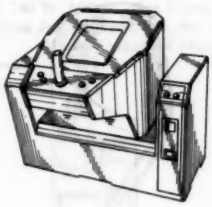


280,834
TABLE TOP ELECTRONIC GAME HOUSING
Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan
Filed Jul. 8, 1983, Ser. No. 511,954
Claims priority, application Japan, Feb. 2, 1983, 58-4010
Term of patent 14 years
U.S. Cl. D21—13



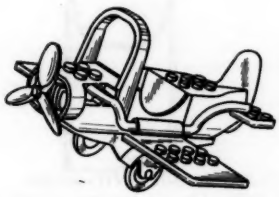
280,835
VIDEO GAME CABINET
Gary Berge, Crystal Lake, and Leo Ludzia, Chicago, both of Ill., assignors to Williams Electronics, Inc., Chicago, Ill.
Filed May 6, 1983, Ser. No. 492,179
Term of patent 14 years
U.S. Cl. D21—13

280,836
VIDEO GAME CABINET
Leo F. Ludzia, and Romeo M. Ishaya, both of Chicago, Ill., assignors to Williams Electronics, Inc., Chicago, Ill.
Filed Jul. 5, 1983, Ser. No. 510,542
Term of patent 14 years
U.S. Cl. D21—13



280,837
TOY MUSIC BOX
Masaharu Takei, Tokyo, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan
Filed Sep. 6, 1983, Ser. No. 529,809
Term of patent 14 years
U.S. Cl. D21—64

280,838
TOY AIR PLANE
Erik P. Tapdrup, Virum, and Gert P. Olsen, Lyngby, both of Denmark, assignors to Interlego AG, Switzerland
Filed Dec. 15, 1983, Ser. No. 561,743
Term of patent 14 years
U.S. Cl. D21—90



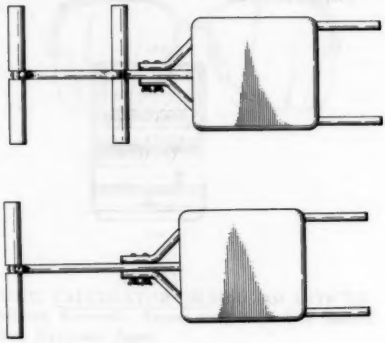
280,839
CONTOURED FABRIC DOLL HEAD
Barbara A. Nihill, 24319 Cheryl Kelton Pl., Newhall, Calif. 91321
Filed Sep. 29, 1982, Ser. No. 427,437
Term of patent 14 years
U.S. Cl. D21—190

280,840
PHYSICAL EXERCISER
Max Dzitzer, 1953 Rayshire St., Thousand Oaks, Calif. 91360
Filed Jun. 8, 1983, Ser. No. 502,299
Term of patent 14 years
U.S. Cl. D21—191

280,841
PHYSICAL EXERCISER
Max Dzitzer, 1953 Rayshire St., Thousand Oaks, Calif. 91360
Filed Jun. 8, 1983, Ser. No. 502,300
Term of patent 14 years
U.S. Cl. D21—191

280,842
FULL BODY WEIGHT TRACTION DEVICE
Jack V. Miller, Sierra Madre, Calif., assignor to Gravity Guidance, Inc., Duarte, Calif.
Filed Mar. 17, 1983, Ser. No. 476,068
Term of patent 14 years
U.S. Cl. D21—191

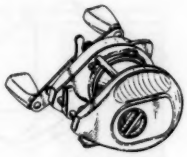
280,843
HORIZONTAL SIT-UP EXERCISER
Robert C. Kelley, and Ira J. Silberman, both of Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.
Filed Feb. 9, 1983, Ser. No. 465,276
Term of patent 14 years
U.S. Cl. D21—191



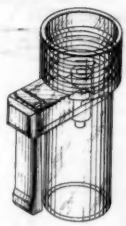
280,844
SAILBOARDING PERSONAL FLOTATION VEST
Karla R. Evert, Roxbury Rte. 4, St. Cloud, Minn. 56301, assignor to Karla R. Evert, St. Cloud, Minn.
Filed Dec. 14, 1982, Ser. No. 449,630
Term of patent 14 years
U.S. Cl. D21—238

280,845
PERSONAL FLOTATION VEST
Karla R. Evert, Roxbury, Rte. 4, St. Cloud, Minn. 56301, assignor to Karla R. Evert, St. Cloud, Minn.
Filed Mar. 4, 1983, Ser. No. 472,092
Term of patent 14 years
U.S. Cl. D21—238

280,846
FISHING REEL
Masakazu Sakamoto, and Takeshi Shohoji, both of Funabashi, Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Mar. 23, 1983, Ser. No. 478,076
Term of patent 14 years
U.S. Cl. D22—25

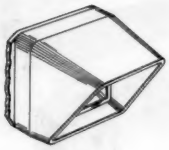


280,847
IN-LINE TRANSPARENT DRIPPER VALVE
Mitchell E. Maddock, Rte. 1, Box 24AA, Florence, Ariz. 85232
Filed Nov. 12, 1982, Ser. No. 442,142
Term of patent 14 years
U.S. Cl. D23—22

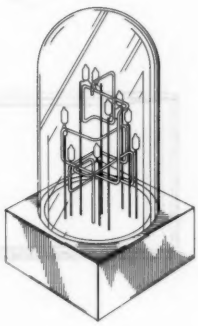


280,848
HYGENIC CARRIER FOR STUD GUN COMPONENTS
Vladimir Reil, 740 W. 16th St., San Pedro, Calif. 90731
Filed Jan. 12, 1983, Ser. No. 457,449
Term of patent 14 years
U.S. Cl. D24—25

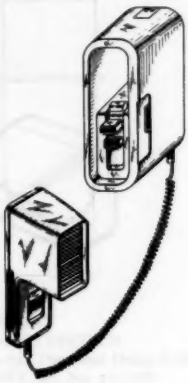
280,849
MOTORCYCLE LIGHT INDICATOR
Michael G. Ofield, 1061 Harding St., Long Beach, Calif. 90805
Filed Jul. 5, 1983, Ser. No. 510,649
Term of patent 14 years
U.S. Cl. D26—28



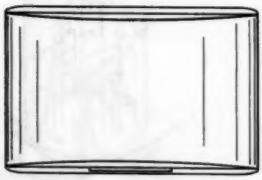
280,850
DECORATIVE LIGHT DISPLAY
Michael B. Merino, deceased, late of La Mesa, Calif., and by Ronald A. Merino, executor, AFROTC-DET 75, San Diego State University, San Diego, Calif. 92182
Filed Apr. 13, 1983, Ser. No. 484,576
Term of patent 14 years
U.S. Cl. D26—102



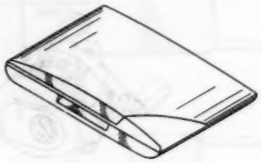
280,851
WALL-MOUNTED HAIR DRYER
Ronald L. Muller, Old Saybrook, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 21, 1982, Ser. No. 451,997
Term of patent 14 years
U.S. Cl. D28—12



280,852
COSMETIC CASE
Dieter Bakic, Munich, Fed. Rep. of Germany, assignor to Revlon, Inc., New York, N.Y.
Filed Nov. 22, 1982, Ser. No. 443,548
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 11 AR 1979/82
The portion of the term of this patent subsequent to Jan. 29, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—83

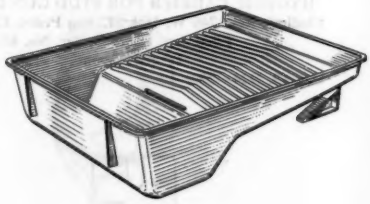


280,853
COSMETIC CASE
Dieter Bakic, Munich, Fed. Rep. of Germany, assignor to Revlon, Inc., New York, N.Y.
Filed Dec. 13, 1982, Ser. No. 449,307
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 11 AR 1979/82
Term of patent 14 years
U.S. Cl. D28—83

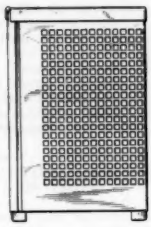


280,854
FRAGRANCE CONTAINER
Norma Matalon, 445 E. 77th St., New York, N.Y. 10021
Division of Ser. No. 238,063, Mar. 2, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 450,864
Term of patent 14 years
U.S. Cl. D28—91.1

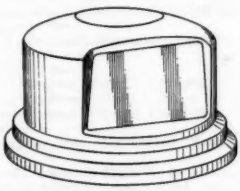
280,855
PAINT TRAY HAVING SUPPORT LEGS
Morley L. Smith, Beaconsfield, Canada, assignor to T. S. Simms & Co., Limited, Saint John, Canada
Filed Jun. 27, 1983, Ser. No. 507,983
Term of patent 14 years
U.S. Cl. D32—53.1



280,856
WASTE RECEPTACLE
Allen L. Michelson, 105 Longfellow Rd., Great Neck, N.Y. 11023
Filed Mar. 21, 1983, Ser. No. 477,537
Term of patent 14 years
U.S. Cl. D34—5



280,857
DOME TOP FOR A WASTE RECEPTACLE
John M. Fuller, Winchester, and Dale T. Maza, Stephenson, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jul. 25, 1983, Ser. No. 517,018
Term of patent 14 years
U.S. Cl. D34—11



280,858
SHOPPING CART
James M. Muellner, White Bear Lake, and Eugene R. Pastien, Moundsview, both of Minn., assignors to Smarte Carte, Inc., White Bear Lake, Minn.
Filed May 6, 1983, Ser. No. 492,415
Term of patent 14 years
U.S. Cl. D34—18

280,859
BASEBALL EQUIPMENT CART
John P. Ott, 550 W. Central, Apt. 1408, Wichita, Kans. 67203
Filed Dec. 13, 1982, Ser. No. 448,965
Term of patent 14 years
U.S. Cl. D34—25

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.M.S.E.A.-Azienda Meccanica: *See—*
Fugazza, Ermanno; and Dal Poz, Giuseppe, 4,543,922, Cl. 123-179.00S.

Aavid Engineering, Inc.: *See—*
McCarthy, Alfred F., 4,544,942, Cl. 357-81.000.

AB Bofors: *See—*
Nilsson, Rolf; Bjornfoth, Hakan; and Slungaard, Knut, deceased, 4,543,808, Cl. 72-137.000.

AB Volvo: *See—*
Roth, Jan, 4,543,854, Cl. 74-713.000.

Abbott Laboratories: *See—*
Wang, Chao-Huei J.; and Jolley, Michael E., 4,544,546, Cl. 424-7.100.

Abdullah, Hilal M.; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Toyne, Kenneth J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal materials containing substituted bicyclo(2,2,2)octanes. 4,544,497, Cl. 252-299.500.

Abe, Masahiro: *See—*
Hirai, Kiyomiki; Takeuchi, Koji; Abe, Masahiro; and Ito, Nobuo, 4,544,733, Cl. 528-123.000.

Abe, Shinichi: *See—*
Amano, Hidetoshi; Abe, Shinichi; Taura, Mitsuharu; and Mizuno, Toshiaki, 4,543,937, Cl. 123-491.000.

Aberg, Kerstin, Guje Slungaard, legal representatives: *See—*
Nilsson, Rolf; Bjornfoth, Hakan; and Slungaard, Knut, deceased, 4,543,808, Cl. 72-137.000.

Abraham, Samuel R. Vehicle gasoline tank cap for gasoline pump flow control. 4,544,007, Cl. 141-392.000.

Abt, Edgar J.: *See—*
Van Buren, Phillip D.; and Abt, Edgar J., 4,544,913, Cl. 340-347.00P.

Acer Automation Company: *See—*
Maples, Stephen S., 4,543,732, Cl. 33-502.000.

ACF Industries, Incorporated: *See—*
Dugge, Richard H., 4,544,306, Cl. 406-30.000.
Gilbert, Richard L., 4,543,851, Cl. 74-531.000.
Randolph, Robert W., 4,544,072, Cl. 213-166.000.

Ackermann, Jacques: *See—*
Geiger, Michel; Gagnebin, Gaston; and Ackermann, Jacques, 4,544,284, Cl. 368-294.000.

Adachi, Shichiro; and Kotani, Sho, to TDK Corporation. Electric soldering iron having a PTC heating element. 4,544,829, Cl. 219-237.000.

Adam-Molina, Solange, to Hoffmann-La Roche Inc. Intermediates for mefloquin. 4,544,748, Cl. 546-167.000.

Adams, Frederick J., to TRW Cam Gears Limited. Rotary valve. 4,544,131, Cl. 251-309.000.

Adleman, Larry G.; and Malanaphy, Richard H., to Ex-Cell-O Corporation. Slug-splitting punch. 4,543,722, Cl. 30-360.000.

Adolph Coors Company: *See—*
Peer, Albert D., Jr.; and Obolewicz, Paul T., 4,544,597, Cl. 428-182.000.

Advanced Solar Systems: *See—*
Gill, Michael; and Rogers, Mark C., 4,543,946, Cl. 126-438.000.

Advanced Technology Laboratories, Inc.: *See—*
Harui, Norio; and Souquet, Jacques, 4,543,960, Cl. 128-660.000.

Aeschlimann, Peter: *See—*
Della Casa, Angelo; and Aeschlimann, Peter, 4,544,373, Cl. 8-639.000.

Afifi, Mostafa S.; and Chiappetta, Frank R., to General Electric Company. Multifrequency reflector antenna. 4,544,928, Cl. 343-781.00P.

Agence Spatiale Europeenne: *See—*
Rhodes, John D.; and Cameron, Richard J., 4,544,901, Cl. 333-212.000.

Agerlid, Charles G. Outer to inner flow vacuum filter with see through outer enclosure. 4,544,387, Cl. 55-274.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Nagel, Erich; Huber, Leonhard; and Lammel, Gunter, 4,544,110, Cl. 242-67.10R.

Ahlers, Klaas: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,544,687, Cl. 523-414.000.

Aichi Steel Works, Ltd.: *See—*
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,544,406, Cl. 75-123.00N.

Aiello, Richard E.; Moist, Stanford C., Jr.; Poleshuk, Robert J.; and Wildman, Timothy C., to AMP Incorporated. Connector having means for positively seating contacts. 4,544,220, Cl. 339-59.00M.

Air Products and Chemicals, Inc.: *See—*
Coe, Charles G.; and Kuznicki, Steven M., 4,544,378, Cl. 55-68.000.

Airesman, Charles: *See—*
Stern, Mark; Airesman, Charles; and Pandit, Vijay, 4,543,837, Cl. 73-862.630.

Aisin Seiki Kabushiki Kaisha: *See—*
Nagashima, Takashi, 4,544,210, Cl. 303-6.00C.
Nakamura, Kaoru, 4,544,075, Cl. 220-82.00R.
Yamaguchi, Hiroji; Hayashi, Masaharu; and Itakura, Masato, 4,544,053, Cl. 192-58.00B.

Ajinomoto Co., Inc.: *See—*
Hirai, Kiyomiki; Takeuchi, Koji; Abe, Masahiro; and Ito, Nobuo, 4,544,733, Cl. 528-123.000.

Akae, Yoshifumi: *See—*
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, 4,543,923, Cl. 123-179.00F.

Akahori, Kimihiko: *See—*
Kodama, Hideyo; Kondo, Yasuo; and Akahori, Kimihiko, 4,544,019, Cl. 164-496.000.

Akashi, Shunji: *See—*
Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, 4,543,805, Cl. 66-148.000.

Aker, Charles M., to Omnithruster, Inc. Shipboard ice lubrication system and jet pump for use therein. 4,543,900, Cl. 114-40.000.

Akhagen, Rune; and Jansson, Arthur, to Forenade Fabriksverken. Increment charge for a finned projectile. 4,543,885, Cl. 102-373.000.

Akiba, Taichi: *See—*
Hirano, Hiroyuki; Kurihara, Toshihiko; Akiba, Taichi; and Araki, Yositsugu, 4,545,003, Cl. 369-43.000.

Akiyama, Synith: *See—*
Itou, Zyouzi; and Akiyama, Synith, 4,544,380, Cl. 55-80.000.

Aktiebolaget Amals Mekaniska Verkstad: *See—*
Andreasson, Bengt A., 4,544,109, Cl. 242-58.100.

Aktiebolaget Hassle: *See—*
Brandstrom, Arne E.; and Lamm, Bo R., 4,544,750, Cl. 546-290.000.

Akzona Incorporated: *See—*
White, Kenneth B.; Richmond, James M.; and Stanley, Keith D., 4,544,506, Cl. 260-462.00R.

Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., to Andrews Maclaren Limited. Collapsible push chair. 4,544,178, Cl. 280-642.000.

Albaugh, E. Kurt, to Dolphin Titan International, Inc. Rig skidding system. 4,544,135, Cl. 254-108.000.

Albert, Glenn D., to Magnetic Peripherals Inc. Flat coil velocity transducer. 4,544,890, Cl. 324-163.000.

Aldrich, Billy R.; and Whitt, William D., to United States of America, National Aeronautics and Space Administration. High gradient directional solidification furnace. 4,544,025, Cl. 165-65.000.

Alexander, Michael P.: *See—*
Kaltz, Milton C.; and Alexander, Michael P., 4,543,747, Cl. 49-249.000.

Alfano, Michael: *See—*
Gardella, John M.; Ciepierski, Casimir; Alfano, Michael; and Chang, Tiang-Shing, 4,544,356, Cl. 433-122.000.

Alford, John A.; Force, Carlton G.; and Gowan, John W., Jr., to Westvaco Corporation. Emulsion polymerization emulsifier. 4,544,726, Cl. 526-309.000.

Alikhan, Raza. Combined surgical instrument polisher and wiper. 4,543,751, Cl. 51-181.00R.

Allegany Technology, Inc.: *See—*
Stern, Mark; Airesman, Charles; and Pandit, Vijay, 4,543,837, Cl. 73-862.630.

Allen, Charles S.; Berg, Arthur A.; Schmitt, Eugene W.; Stoltenberg, Michael R.; and Lissau, Frederic, to Sloan Valve Company. Combination gladhand and shutoff valve. 4,544,132, Cl. 251-318.000.

Allen Engineering Corporation: *See—*
Allen, J. Dewayne, 4,544,346, Cl. 425-456.000.

Allen, Frederick C., to Owens-Illinois, Inc. Plural bottle carrier. 4,544,194, Cl. 294-87.200.

Allen, J. Dewayne, to Allen Engineering Corporation. Concrete screed with curb forming apparatus. 4,544,346, Cl. 425-456.000.

Allen, Richard B.; and Avakian, Roger W., to General Electric Company. Foamable polycarbonate compositions, articles and methods. 4,544,677, Cl. 521-91.000.

Allied Corporation: *See—*
Borden, Raymond W., 4,544,052, Cl. 192-56.00R.
Hirose, Takao, 4,544,227, Cl. 339-143.00R.
Iadarola, Ralph E.; Strassle, Warren F.; and Russo, Gene W., 4,543,715, Cl. 29-852.000.
Li, Hsin L.; and Oswald, Hendrikus J., 4,544,594, Cl. 428-92.000.
Mullins, Phillip L.; Neal, James G.; and Perkins, Jeffrey T., 4,544,579, Cl. 427-175.000.

Runkle, Dean E., 4,544,045, Cl. 188-72.600.
Alps Electric Co., Ltd.: *See—*
Yoshisato, Akiyuki, 4,544,951, Cl. 358-172.000.
Alston, Arthur: *See—*
Chin, Thomas G.; and Alston, Arthur, 4,543,819, Cl. 73-64.200.
Altman, Ted N.; and Fedele, Nicola J., to RCA Corporation. Low cost monotonic digital-to-analog converter. 4,544,911, Cl. 340-347.0DA.
Aluminum Company of America: *See—*
Heffner, Robert E.; and Davidson, John J., 4,544,475, Cl. 204-300.0EC.
Amano, Hidetoshi; Abe, Shinichi; Taura, Mitsuharu; and Mizuno, Toshiaki, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Method and apparatus for controlling fuel injection rate in internal combustion engine. 4,543,937, Cl. 123-491.000.
Amano, Yoshinori: *See—*
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, 4,544,962, Cl. 360-40.000.
Amaral, Joseph E. S.: *See—*
Blatter, Harold; and Amaral, Joseph E. S., 4,544,923, Cl. 340-825.690.
AMAX Inc.: *See—*
Chou, Eddie C.; Wiegers, Ben W.; Huggins, Dale K.; and Wiewiorowski, Edward I., 4,544,541, Cl. 423-508.000.
American Cyanamid Company: *See—*
Bright, John H., 4,544,779, Cl. 568-918.000.
Epstein, Joseph W.; McKenzie, Thomas C.; and Fanshawe, William J., 4,544,665, Cl. 514-412.000.
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,544,759, Cl. 556-36.000.
Los, Marinus, 4,544,754, Cl. 548-301.000.
American District Telegraph Company: *See—*
Galvin, Aaron A.; Harvey, Roy L.; and Leff, Kenneth J., 4,544,836, Cl. 235-487.000.
American Hoechst Corporation: *See—*
Bower, J. David, 4,544,694, Cl. 524-385.000.
American Home Products Corporation: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,544,757, Cl. 548-432.000.
American Hospital Supply Corporation: *See—*
Dormandy, Ray H., Jr.; and Coe, Frederick L., 4,544,371, Cl. 604-891.000.
American Safety Equipment Corporation: *See—*
Ziv, Avraham, 4,544,112, Cl. 242-107.200.
American Standard Inc.: *See—*
Clemmons, Quentin T.; and Czerniewski, Paul F., 4,544,047, Cl. 188-170.000.
Crook, Mikel S.; and Decker, Douglas E., 4,544,030, Cl. 165-159.000.
Han, Doyoung; and Hansen, William G., 4,543,796, Cl. 62-160.000.
Amerock Corporation: *See—*
Clemmons, Richard R.; Zimmer, Darrel E.; and Sanders, Stephen H., III, 4,544,866, Cl. 318-54.000.
Sharp, William G., 4,544,865, Cl. 318-53.000.
AMF Incorporated: *See—*
Fehrenkamp, William; and Jameson, Joe P., 4,545,040, Cl. 367-76.000.
AMP Incorporated: *See—*
Aiello, Richard E.; Moist, Stanford C., Jr.; Poleshuk, Robert J.; and Wildman, Timothy C., 4,544,220, Cl. 339-59.00M.
Ampex Corporation: *See—*
Louth, Kenneth, 4,544,967, Cl. 360-77.000.
AMSTED Industries Incorporated: *See—*
Pozo, Jaime F., 4,545,058, Cl. 373-73.000.
Ancos Co., Ltd.: *See—*
Hashimoto, Yasuyuki; and Shimizu, Kazuo, 4,544,295, Cl. 401-65.000.
Anderson, Edward, Jr., to Goodyear Tire & Rubber Company, The. Reclaiming of vulcanized rubber. 4,544,675, Cl. 521-43.000.
Anderson, Graydon E. Internal roll compression system. 4,543,881, Cl. 100-121.000.
Anderson, Hugh G., Jr.: *See—*
Shapiro, Wilbur; Graham, Richard W., II; and Anderson, Hugh G., Jr., 4,544,285, Cl. 384-99.000.
Anderson, James E.; Coleman, Michael J.; and Livermore, Frederick C., to Northern Telecom Limited. Overvoltage protection device. 4,544,983, Cl. 361-119.000.
Anderson, Richard J.; and Leippe, Michael M., to Zoecon Corporation. Compositions. 4,544,400, Cl. 71-90.000.
Anderson, Richard N., to Hunter Douglas Industries B.V. Apparatus for assembling slatted venetian blinds. 4,543,699, Cl. 29-24.500.
Anderson, Thomas W.; Milczarek, Richard J.; and Peters, Carl H., to AT&T Bell Laboratories. Announcement system message playback arrangement. 4,545,043, Cl. 369-32.000.
Anderson, Todd B.; Glaser, Thomas W.; and Neesz, John J., to International Business Machines Corporation. Sector servo seek control. 4,544,968, Cl. 360-78.000.
Andersson, Lars-Olof: *See—*
Stark, Sven O. S.; and Andersson, Lars-Olof, 4,544,093, Cl. 229-43.000.
Andersson, Ove. Electrical contact. 4,544,222, Cl. 339-75.00M.
Ando, Kunio: *See—*
Osawa, Michitaka; Funada, Etuo; Miyajima, Hiroyuki; Mackawa, Hitoshi; and Ando, Kunio, 4,544,896, Cl. 330-284.000.
Andreas Stihl: *See—*
Bortfeld, Manfred; Schieber, Eberhard; and Dietzsch, Gunter, 4,543,723, Cl. 30-381.000.
Andreasson, Bengt A., to Aktiebolaget Amals Mekaniska Verkstad. Roll stands for simple roll replacement. 4,544,109, Cl. 242-58.100.
Andresen, Bernhard H.: *See—*
Taka, Hideo; and Andresen, Bernhard H., 4,544,257, Cl. 354-460.000.
Andrews Maclaren Limited: *See—*
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.
Andrus, W. Alexander; Christensen, Burton G.; and Heck, James V., to Merck & Co., Inc. 6-(1-Hydroxyethyl)-2-(2-aminoethylthio)-3-tetrazoly-1-carbadethiapen-2-em. 4,544,557, Cl. 514-210.000.
Angebault, Joel: *See—*
Moessinger, Albert; Gosciniak, Guy; and Angebault, Joel, 4,544,001, Cl. 139-443.000.
Angevine, Peter A.; Bengtsson, Sune; and Koudijs, George P., to Dorr-Oliver Incorporated. Method for oxidation of flue gas desulfurization absorbent and the product produced thereby. 4,544,542, Cl. 423-555.000.
Angle, Christopher P.; and Parker, Barry R., to General Motors Corporation. Adjustable latch striker. 4,544,192, Cl. 292-341.180.
Anic S.p.A.: *See—*
Oberrauch, Ermanno; and Eberson, Lennard, 4,544,450, Cl. 204-59.00R.
Priola, Aldo; Romano, Ugo; and Renzi, Fiorenzo, 4,544,725, Cl. 526-301.000.
Antes, Gregor, to LGZ Landis & Gyr Zug AG. Apparatus and a method for testing the authenticity of documents. 4,544,266, Cl. 356-71.000.
Anzai, Yoshinori: *See—*
Yamazaki, Hiroyoshi; Minagawa, Yoshiji; Tsuchihashi, Michihiro; Anzai, Yoshinori; and Kajiwara, Toshiro, 4,544,862, Cl. 315-209.00R.
Aoki, Fujio; and Koike, Kazumi, to Diesel Kiki Company, Ltd. Fuel injection device. 4,544,097, Cl. 239-126.000.
Aoki, Harumi: *See—*
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, 4,544,848, Cl. 250-578.000.
Aoki, Tadamichi: *See—*
Ayusawa, Tadashi; Aoki, Tadamichi; and Hamana, Ryozo, 4,544,749, Cl. 546-184.000.
Aoyama, Yasuaki, to Toyota Jidosha Kabushiki Kaisha. Progressive forming method of product having varied cross-sectional length. 4,543,811, Cl. 72-332.000.
Apple, Howard P.: *See—*
Medero, Richard; Hood, Rush W.; Apple, Howard P.; and Ramsey, Maynard, III, 4,543,962, Cl. 128-682.000.
Aqua Control, Inc.: *See—*
Meuleman, Guy A., 4,543,990, Cl. 137-556.000.
Arakawa Kagaku Kogyo Kabushiki Kaisha: *See—*
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, 4,544,414, Cl. 106-287.240.
Araki, Yositsugu: *See—*
Hirano, Hiroyuki; Kurihara, Toshihiko; Akiba, Taichi; and Araki, Yositsugu, 4,545,003, Cl. 369-43.000.
Arav, Ronnie A., to Beloit Corporation. Valves. 4,543,977, Cl. 137-115.000.
Arav, Ronnie A., to Beloit Walmsley Limited. Apparatus for de-watering fibrous suspensions. 4,544,449, Cl. 162-374.000.
Arcair Company: *See—*
Moore, Paul E.; Strohl, Robert L.; and Soisson, Lawrence R., 4,544,139, Cl. 266-48.000.
Architectural Resources Cambridge, Inc.: *See—*
Nizel, Robert N.; and Schimmoller, Frank D., 4,544,214, Cl. 312-209.000.
Arenas, Alvaro; Box, John W.; Davis, Joseph H.; and Tataria, Harshad, to Cordis Corporation. Sealed closure for sealing and closing an opening in a container. 4,544,078, Cl. 220-256.000.
Ariel, Gideon B., to Pepsico, Inc. Passive programmable resistance device. 4,544,154, Cl. 272-129.000.
Ariizumi, Shoji; and Segawa, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having multiple conductive layers and the method of manufacturing the semiconductor device. 4,544,941, Cl. 357-71.000.
Aristoff, Paul A., to Upjohn Company, The. Interphenylene carbacyclin compound. 4,544,764, Cl. 560-56.000.
Armada Corporation: *See—*
Hochstein, Peter A., 4,544,988, Cl. 361-211.000.
Arneson, Howard M. Marine outdrive apparatus. 4,544,362, Cl. 440-61.000.
Arnold, Fred E.: *See—*
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,544,713, Cl. 525-432.000.
Arnold, Rudolf, to Claas Saulgau GmbH. Harvesting attachment for stalk fruits standing in rows. 4,543,774, Cl. 56-98.000.
Arnon, Ephraim, to Northern Telecom Limited. Decision feedback adaptive equalizer acting on zero states following a non-zero state. 4,545,060, Cl. 375-14.000.
Aronson, David V. Automatic spring compressing machine. 4,544,002, Cl. 140-89.000.
Artz, Gerd: *See—*
Figge, Dieter; Siemer, Hans; Artz, Gerd; and Philipp, Clemens, 4,544,018, Cl. 164-481.000.

Arvai, Ernest P., to Puratrol, Inc. Dynamic, reverse-flow oil purifier device. 4,544,483, Cl. 210-316.000.
Arvin Industries, Inc.: *See—*
Otterbein, Roy T., 4,544,513, Cl. 261-153.000.
Asada, Kazuhiko: *See—*
Yamada, Kaneo; Okamoto, Shigemi; and Asada, Kazuhiko, 4,544,514, Cl. 261-153.000.
Asahi Giken Kogyo Kabushiki Kaisha: *See—*
Minamida, Ataru, 4,544,818, Cl. 219-10.49R.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Haraguchi, Keisuke; and Kando, Toru, 4,544,251, Cl. 354-288.000.
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, 4,544,848, Cl. 250-578.000.
Asakawa, Chosei: *See—*
Yoshida, Shigeru; Shiraishi, Norihisa; Asakawa, Chosei; and Sakaguchi, Morohira, 4,544,142, Cl. 266-252.000.
Asakawa, Kenichi: *See—*
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,544,233, Cl. 350-96.200.
ASC Incorporated: *See—*
Kaltz, Milton C.; and Alexander, Michael P., 4,543,747, Cl. 49-249.000.
Ashida, Takahiro: *See—*
Nishikawa, Masao; and Ashida, Takahiro, 4,543,768, Cl. 53-117.000.
Ashland Oil, Inc.: *See—*
Wombles, Robert H.; Carlos, Donald D.; and Gannon, Charles R., 4,544,411, Cl. 106-279.000.
AT&T Bell Laboratories: *See—*
Anderson, Thomas W.; Milczarek, Richard J.; and Peters, Carl H., 4,545,043, Cl. 369-32.000.
Beale, Richard G.; and Ganesan, Apparajan, 4,544,878, Cl. 323-315.000.
DeVeau, George F., Jr.; and Miller, Calvin M., 4,544,234, Cl. 350-96.210.
Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., 4,544,804, Cl. 179-18.0BC.
Luther, Lars C.; and Rana, Virendra V. S., 4,544,438, Cl. 156-624.000.
Maher, David P.; and Rance, Robert J., 4,545,024, Cl. 364-717.000.
Sharper, Craig A., 4,544,916, Cl. 340-347.0DD.
Tu, Peter J., 4,544,950, Cl. 358-143.000.
AT&T Information Systems Inc.: *See—*
Raamot, Jaan, 4,545,053, Cl. 370-68.000.
AT&T Technologies, Inc.: *See—*
Rapp, Willard E., 4,543,713, Cl. 29-837.000.
Atlantic Richfield Company: *See—*
Breder, E. William, Jr.; Jaecker, John A.; and Johnson, Marvin F. L., 4,544,786, Cl. 585-500.000.
Breder, E. William, Jr., 4,544,787, Cl. 585-500.000.
Fisher, Edwin N., 4,544,304, Cl. 404-17.000.
Gupta, Vijai P., 4,544,453, Cl. 203-44.000.
Mancinelli, Paul A., 4,544,711, Cl. 525-348.000.
Miller, Richard F.; and Nicholson, Michael P., 4,544,794, Cl. 585-721.000.
Miller, Richard F.; and Nicholson, Michael P., 4,544,795, Cl. 585-721.000.
Sofranko, John A.; and Jones, C. Andrew, 4,544,784, Cl. 585-500.000.
Withers, Howard P.; and Sofranko, John A., 4,544,785, Cl. 585-500.000.
Atlas Pacific Engineering Company: *See—*
Meissner, Konrad E.; and Colombo, John W., 4,544,005, Cl. 141-94.000.
Atmospheric Instrumentation Research, Inc.: *See—*
Call, David B., 4,543,836, Cl. 73-861.850.
Aubert, Jacques; Bethuel, Louis; and Carles, Maurice, to Commissariat a l'Energie Atomique. Uranium hexafluoride purification process. 4,544,531, Cl. 423-19.000.
Audi Nsu Auto Union Aktiengesellschaft: *See—*
Ruf, Max, 4,543,925, Cl. 123-188.00S.
Audykowski, Thaddeus; Mentha, Anton; and Losert, Ewald, to Ciba-Geigy Corporation. Photosensitive coating composition and the use thereof for protective purposes. 4,544,623, Cl. 430-280.000.
Automotive Products plc: *See—*
Webster, Henry G.; and Bainbridge, Wilfred N., 4,544,057, Cl. 192-0.076.
Avakian, Roger W.: *See—*
Allen, Richard B.; and Avakian, Roger W., 4,544,677, Cl. 521-91.000.
Avci, Sakir T.: *See—*
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.
Awane, Katunobu: *See—*
Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, 4,544,989, Cl. 361-401.000.
Ayusawa, Tadashi; Aoki, Tadamichi; and Hamana, Ryozo, to Mitsubishi Petrochemical Company Limited. Process for production of piperidine. 4,544,749, Cl. 546-184.000.
B&B Specialties Inc.: *See—*
Bauer, Gerald; and Swan, Henry B., 4,543,942, Cl. 126-314.000.
B. F. Goodrich Company, The: *See—*
Myers, Ronald E., 4,544,695, Cl. 524-405.000.
Babcock, Michael A. Slalom waterskiing simulator. 4,544,153, Cl. 272-97.000.
Babin, Michel: *See—*
Millot, Jean-Paul; Desfontaines, Guy; and Babin, Michel, 4,544,521, Cl. 376-209.000.
Bacardit, Juan S.: *See—*
Coll, Juan S.; Bofill, Joaquim F.; and Bacardit, Juan S., 4,543,790, Cl. 60-547.100.
Bachmann, Wilhelm; and Kemner, Axel, to WABCO Westinghouse Steuerungstechnik GmbH. Fluid pressure regulating valve mechanism. 4,543,975, Cl. 137-85.000.
Badenhorst, Jurchens B.: *See—*
Sanderson, Ronald D.; and Badenhorst, Jurchens B., 4,544,589, Cl. 428-35.000.
Baer, James R.; Manes, Kenneth; and Lunka, Harold, to Storage Technology Partners II. Recording disk load and unload apparatus. 4,545,045, Cl. 369-77.200.
Baggett, Gary P.; Peterson, Robert D.; and Penner, Wayne A., to Mobil Oil Corporation. DC offset filter. 4,545,026, Cl. 364-724.000.
Baggott, George T., to Crescent Metal Products Inc. Insulated cabinet with interchangeable heat transfer unit. 4,544,024, Cl. 165-48.00R.
Bailey, J. Barry W.: *See—*
Mackey, Phillip J.; and Bailey, J. Barry W., 4,544,141, Cl. 266-215.000.
Bailey, William L.; and Kaszeta, William J., to Solavolt International. Voltage regulator. 4,544,876, Cl. 323-282.000.
Bainbridge, Wilfred N.: *See—*
Webster, Henry G.; and Bainbridge, Wilfred N., 4,544,057, Cl. 192-0.076.
Baker, Don R.: *See—*
Tam, Teresa M.; and Baker, Don R., 4,544,398, Cl. 71-88.000.
Baker, Gordon P.: *See—*
Warman, Thomas E.; Baker, Gordon P.; and Smith, James E., 4,544,090, Cl. 227-131.000.
Baker Oil Tools, Inc.: *See—*
Echols, John B., 4,544,032, Cl. 166-267.000.
Stout, Gregg W.; and Nelson, John A., 4,543,700, Cl. 29-426.400.
Wetzel, Rodney J.; and Stout, Gregg W., 4,543,703, Cl. 29-455.00R.
Baker, Quentin A., to Southwest Research Institute. Staged direct injection diesel engine. 4,543,930, Cl. 123-299.000.
Baker, William R., to Thrall Car Manufacturing Company. Center beam railroad freight car. 4,543,887, Cl. 105-355.000.
Balliet, Layton; Wantshouse, Richard A.; and Wylie, Thomas J., to International Business Machines Corporation. Fiber optic loop system with bypass mode. 4,545,074, Cl. 455-601.000.
Baltruschat, Helmut: *See—*
Schnurbusch, Horst; and Baltruschat, Helmut, 4,544,402, Cl. 71-93.000.
Bandoh, Kazuo; and Osada, Michio. Apparatus for cleaning plastics forming mold faces. 4,543,684, Cl. 15-309.000.
Bankston, Patrick D. Illuminated buoy marker. 4,544,364, Cl. 441-6.000.
Barchus, Oscar W. Animal skinning holder. 4,543,688, Cl. 17-44.300.
Bardos, Thomas J.; Perlman, Michael E.; and MacDiarmid, Joan E., to Research Foundation of State University of New York, The. Bis(2,2-dimethyl-1-aziridinyl)phosphinic amides for use in the treatment of tumors. 4,544,501, Cl. 260-239.0EP.
Barkas, Emanuel E., to Harvey Hubbell Incorporated. Shuttered electrical receptacle. 4,544,219, Cl. 339-40.000.
Barker, W. David; Heisey, Raymond K., Jr.; and Mariano, Arturo C., to Butler Manufacturing Company. Attachment clip unit for standing seam roof. 4,543,760, Cl. 52-544.000.
Barnes, James L.: *See—*
Studt, William L.; Dodson, Stuart A.; Zimmerman, Harry K.; and Barnes, James L., 4,544,670, Cl. 514-617.000.
Barnett, Allen M., to University of Delaware. Window structure for passivating solar cells based on gallium arsenide. 4,544,799, Cl. 136-262.000.
Barnett, Don C., to Exxon Research and Engineering Co. Ink jet apparatus and method of making the apparatus. 4,544,932, Cl. 346-140.00R.
Barnett, Ronald E., to General Foods Corporation. Foodstuffs containing sweetness inhibiting agents. 4,544,565, Cl. 426-538.000.
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., to General Foods Corporation. 3-Hydroxy-4-alkyloxyphenyl heterocyclic carbonates. 4,544,566, Cl. 426-548.000.
Baron, Walter J., to Water Services of America, Inc. Fluid flow diverter valve with improved flow-through construction. 4,543,996, Cl. 137-625.430.
Baron, Walter J., to Water Services of America, Inc. Heat exchanger tube cleaning element capturing device with hinged retainer. 4,544,026, Cl. 165-95.000.
Barrett, George M. Method and apparatus for extracting heat from a natural water source. 4,544,021, Cl. 165-45.000.
Barrett, Lawrence G. Unitized floor panel and method of laying the same. 4,543,765, Cl. 52-747.000.
Bartl, Knut: *See—*
Ziegenhorn, Joachim; Roder, Albert; Bartl, Knut; and Wehmeyer, Gunter, 4,544,630, Cl. 435-11.000.
Basener, Helmut, to INA Walzlager Schaeffler KG. Bearing seal with dual sealing lips. 4,544,286, Cl. 384-486.000.
BASF Aktiengesellschaft: *See—*
Baumann, Hans; and Kaack, Hermann, 4,544,738, Cl. 534-617.000.
Hagen, Helmut; and Kohler, Rolf-Dieter, 4,544,755, Cl. 548-335.000.

Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,544,687, Cl. 523-414.000.
Schwen, Roland, 4,544,377, Cl. 51-298.000.
Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel, 4,544,758, Cl. 549-407.000.

Basf Wyandotte Corporation: *See—*
Narayan, Thirumurti, 4,544,763, Cl. 560-26.000.
Schmolka, Irving R., 4,544,495, Cl. 252-174.210.

Basnett, Robert T., to Westinghouse Electric Corp. Vacuum contactor with kickout spring. 4,544,817, Cl. 200-293.000.

Bassetti, Larry W.; and Kantor, Sherwood, to International Business Machines Corporation. Fine line print enhancement. 4,544,264, Cl. 355-14.00R.

Bata Industries Limited: *See—*
Schilke, Waldemar, 4,544,519, Cl. 264-328.100.

Bates, Kenneth W.; and Watts, Norman H., to USS Engineers & Consultants, Inc. Sliding gate valves. 4,543,981, Cl. 137-315.000.

Battelle Development Corporation: *See—*
Caulfield, Henry J., 4,544,230, Cl. 350-96.140.
Hughes, Kenneth E.; Hutson, Timothy B.; and Fink, David J., 4,544,516, Cl. 264-108.000.
Verber, Carl M., 4,544,229, Cl. 350-96.140.

Battelle-Institut e.V.: *See—*
Hartmann, Rolf; Krah, Albrecht; Egle, Hilda; and Ziegler, Rudolf, 4,544,441, Cl. 156-634.000.

Bauer, Angelo: *See—*
Schonfeld, Harald; and Bauer, Angelo, 4,543,825, Cl. 73-459.000.

Bauer, Gerald; and Swan, Henry B., to B&B Specialties Inc. Insulated flue assembly. 4,543,942, Cl. 126-314.000.

Baumann, Hans; and Kaack, Hermann, to BASF Aktiengesellschaft. Reactive pyrazole group containing monoazo dye. 4,544,738, Cl. 534-617.000.

Baunach, Steven C.; Riley, James A.; and Okimura, Lucy, to Pitney Bowes Inc. Word processing system with foreground/background capability. 4,545,015, Cl. 364-200.000.

Bayer Aktiengesellschaft: *See—*
Claussen, Uwe; and Harnisch, Horst, 4,544,496, Cl. 252-301.350.
Claussen, Uwe; Hannes, Hellmut; and Weber, Hans-Leo, 4,544,583, Cl. 428-1.000.
Fuchs, Rainer; and Naumann, Klaus, 4,544,508, Cl. 260-465.00D.
Heise, Klaus-Peter; Kuth, Robert; Neufang, Karl; Pantke, Hellmuth; and Wedemeyer, Karlfried, 4,544,372, Cl. 8-602.000.
Muller, Peter; Wagner, Kuno; Wegner, Christian; and Schwabe, Peter, 4,544,683, Cl. 523-111.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,544,658, Cl. 514-254.000.
Schauf, Dieter, 4,544,588, Cl. 428-35.000.
Schmidt, Friedrich, 4,544,381, Cl. 55-89.000.
Schmidt, Thomas, 4,544,744, Cl. 544-182.000.
Stohr, Frank-Michael; and Nickel, Horst, 4,544,737, Cl. 534-605.000.
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.

Bayer, Helmut, to Electrovac Fabrikation elektrotechnischer Spezialartikel Gesellschaft m.b.H. Hot warning device for cooking apparatus. 4,544,831, Cl. 219-449.000.

Bayliss, Keith: *See—*
Irvine, Robert; Luperti, Harry E.; and Bayliss, Keith, 4,544,150, Cl. 271-145.000.

BBC Brown, Boveri & Company, Limited: *See—*
Muller, Alfred; and Seiffert, Harry, 4,543,780, Cl. 57-406.000.
Prenner, Herbert; and Schroder, Paul, 4,544,855, Cl. 310-59.000.
Vitins, Janis, 4,545,006, Cl. 363-124.000.

BBS Kraftfahrzeugtechnik, GmbH+Co. KG.: *See—*
Braungart, Martin, 4,544,209, Cl. 301-37.0AT.

Beale, Richard G.; and Ganesan, Apparajan, to AT&T Bell Laboratories. Switched current mirror. 4,544,878, Cl. 323-315.000.

Beauch, Howard D., to General Motors Corporation. Tilt steering column for vehicles. 4,543,848, Cl. 74-493.000.

Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., to Eli Lilly and Company. 3-Aryl-5-isothiazolecarboxylic acids and related compounds used to lower uric acid levels. 4,544,752, Cl. 548-214.000.

Beck, Malcolm. Multiple use decorative edging. 4,543,745, Cl. 47-33.000.

Becker, Emil: *See—*
Linkert, Reinhold; Becker, Emil; and Hoffmann, Horst, 4,544,407, Cl. 75-130.00A.

Becker, Reinhard, to Karl Becker GmbH & Co. KG. Separating and depositing single pieces of grain. 4,544,082, Cl. 221-200.000.

Becker, Werner: *See—*
Schrotz, Kurt; and Becker, Werner, 4,544,433, Cl. 156-384.000.

Bedford, C. Mitchell: *See—*
Chase, David W., 4,544,028, Cl. 165-104.140.

Bednar, Richard D.; and Hampton, James K., to Ransomes, Inc. Neutral lock mechanism for a direction and speed control pedal. 4,543,850, Cl. 74-512.000.

Beecham Group p.l.c.: *See—*
Hadley, Michael S.; and King, Francis D., 4,544,660, Cl. 514-329.000.
Harbridge, John B., 4,544,549, Cl. 424-114.000.

Belforte, Piero; Bostica, Bruno; Pilati, Luciano; Bovo, Amilcare; and Canato, Luigi, to Cselt Centro Studi E Laboratori. Switching unit for the transfer of digitized signals in PCM system. 4,545,051, Cl. 370-66.000.

Bell & Howell Company: *See—*
Zemke, Edward H., deceased; Pogue, Harold D.; Shah, Girish B.; and Bowles, Myron A., 4,544,146, Cl. 270-58.000.

Bell, Robert A.: *See—*
Kern, Mark T.; Bell, Robert A.; and Riedl, Max J., 4,544,843, Cl. 250-239.000.

Bellay, Jeffrey D.; and Thaden, Robert C., to Texas Instruments Incorporated. Precharged discharge sensing for EPROM. 4,545,038, Cl. 365-230.000.

Beloit Corporation: *See—*
Arav, Ronnie A., 4,543,977, Cl. 137-115.000.

Beloit Walmsley Limited: *See—*
Arav, Ronnie A., 4,544,449, Cl. 162-374.000.

Belokopytov, Jury A.: *See—*
Sominin, Mikhail A.; Surikov, Valery N.; Belokopytov, Jury A.; and Fesenko, Evgeny P., 4,545,008, Cl. 364-148.000.

Belt, Roger F.: *See—*
Shone, Michael F.; and Belt, Roger F., 4,544,239, Cl. 350-376.000.

Ben-Gurion University of The Negev Research and Development Authority: *See—*
Pack, Isak; Veintraub, David; Yarkoni, Abraham; and Merchuk, Josef, 4,543,965, Cl. 128-748.000.

Bencuya, Izak; and Cogan, Adrian I., to GTE Laboratories Incorporated. Fabrication of junction field effect transistor with filled grooves. 4,543,706, Cl. 29-571.000.

Bendiberica, S.A.: *See—*
Coll, Juan S.; Bofill, Joaquim F.; and Bacardit, Juan S., 4,543,790, Cl. 60-547.100.

Bengtsson, Sune: *See—*
Angevine, Peter A.; Bengtsson, Sune; and Koudijs, George P., 4,544,542, Cl. 423-555.000.

Benjamin, Kelly L., to Dow Corning Corporation. Primer compositions for improving adhesion of abrasion resistant silicone coatings to plastic surfaces. 4,544,582, Cl. 427-407.100.

Bennett, Edward A.: *See—*
Bennett, James F.; and Bennett, Edward A., 4,543,972, Cl. 135-118.000.

Bennett, James F.; and Bennett, Edward A. Lockable tent stake. 4,543,972, Cl. 135-118.000.

Benz, Dieter. Switching arrangement for a rotating toothbrush. 4,544,816, Cl. 200-52.00R.

Berchtold, Jean: *See—*
West, Bradford D., Jr.; and Berchtold, Jean, 4,544,974, Cl. 360-120.000.

Berg, Arthur A.: *See—*
Allen, Charles S.; Berg, Arthur A.; Schmitt, Eugene W.; Stoltenberg, Michael R.; and Lissau, Frederic, 4,544,132, Cl. 251-318.000.

Berg, Eric P.: *See—*
Sandvig, Timothy C.; Ersfeld, Dean A.; and Berg, Eric P., 4,544,572, Cl. 427-44.000.

Berg, Lloyd; and Yeh, An-I. Separation of isopropyl ether from methyl ethyl ketone by extractive distillation. 4,544,454, Cl. 203-51.000.

Berger, Michael F., to Tandy Corporation. Memory management system. 4,545,016, Cl. 364-200.000.

Berndt, Dale F., to Particulate Instruments. Smoke opacity meter. 4,544,273, Cl. 356-434.000.

Berry, C. Bernard, to Ethyl Corporation. Process for producing acyloxybenzenesulfonate salts. 4,544,503, Cl. 260-402.000.

Berstermann, Wilhelm; Grisar, Ulrich; and Koerfer, Egon, to Klockner-Werke Aktiengesellschaft. Apparatus for the spectrographic analysis of workpieces formed from iron and steel alloys. 4,544,270, Cl. 356-313.000.

Bertolazzi, Luciano F.: *See—*
Laverman, Royce J.; and Bertolazzi, Luciano F., 4,543,978, Cl. 137-255.000.

Bertsch, Peter K., to Helix Technology Corporation. Refrigeration system with clearance seals. 4,543,792, Cl. 62-6.000.

Bessette, Richard P. Convertible hopper car. 4,543,888, Cl. 105-377.000.

Best, Christopher H.; and Seilly, Alec H., to Lucas Industries Limited. Linear transducers. 4,544,905, Cl. 336-136.000.

Beta II, Incorporated: *See—*
Volk, Joseph A., Jr.; and Volk, Joseph A., 4,543,835, Cl. 73-861.730.

Bethuel, Louis: *See—*
Aubert, Jacques; Bethuel, Louis; and Carles, Maurice, 4,544,531, Cl. 423-19.000.

Bevan, David R.: *See—*
Islam, Abul B. M. A.; and Bevan, David R., 4,543,966, Cl. 128-754.000.

Bezman, Richard D.: *See—*
Klaassen, Alan W.; and Bezman, Richard D., 4,544,645, Cl. 502-66.000.

Biale, John, to Union Oil Company of California. Composition for improved adhesion of vinylidene chloride latex to ionomer films. 4,544,699, Cl. 524-512.000.

Biallas, Bernd: *See—*
Struck, Bernd-Dieter; Biallas, Bernd; and Schulten, Rudolf, 4,544,459, Cl. 204-103.000.

Bianchi, Giuseppe; Mussinelli, Gianluigi; and Faita, Giuseppe, to Oronzio de Nora S.A. Ground anode prepacked with backfill in a flexible structure for cathode protection with impressed currents. 4,544,464, Cl. 204-147.000.

Biard, James R.; and Elmer, Ben R., to Spectronics, Inc. Data transmission link. 4,545,076, Cl. 455-612.000.

Biesecker, Douglas A.: *See—*
Porterfield, Richard; Soth, Henry J.; and Biesecker, Douglas A., 4,543,705, Cl. 29-566.300.

Bilen, Roger J., to Owens-Corning Fiberglas Corporation. Rotary fiber forming method and apparatus. 4,544,393, Cl. 65-6.000.

Billings, Bruce J., to Durr Industries, Inc. Oven heat exchanger. 4,544,526, Cl. 422-173.000.

Bily, Robert R. Starter cultures of improved activity for dairy products and process of making same. 4,544,636, Cl. 435-253.000.

Binder, Dieter: *See—*
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,544,655, Cl. 514-222.000.

Bitha, Panayota: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,544,759, Cl. 556-36.000.

Bittle, James L.; and Lerner, Richard A., to Scripps Clinic and Research Foundation. Synthetic foot and mouth disease antigen. 4,544,500, Cl. 260-112.50R.

Bizerba-Werke Wilhelm Kraut GmbH & Co. KG: *See—*
Maurer, Albrecht; and Frey, Karl, 4,543,868, Cl. 83-713.000.

Bjornfoth, Hakan: *See—*
Nilsson, Rolf; Bjornfoth, Hakan; and Slungaard, Knut, deceased, 4,543,808, Cl. 72-137.000.

Black & Decker Inc.: *See—*
Miller, Walter E., 4,544,830, Cl. 219-328.000.

Blackstone, Ralf W. Cervical spine collar. 4,543,947, Cl. 128-75.000.

Blatter, Harold; and Amaral, Joseph E. S., to RCA Corporation. Microprocessor self-turn-off arrangement for a consumer instrument. 4,544,923, Cl. 340-825.690.

Blaupunkt Werke GmbH: *See—*
Diepholz, Tilo; Hapke, Walter; Wohl, Wilhelm; and Schindler, H.-Joachim, 4,544,965, Cl. 360-71.000.

Blewitt, Donald D.; and Gupta, Tapan K., to Westinghouse Electric Corp. Fuse with electro-negative gas interrupting means. 4,544,908, Cl. 337-279.000.

Block Drug Company Inc.: *See—*
Gardella, John M.; Ciepierski, Casimir; Alfano, Michael; and Chang, Tiang-Shing, 4,544,356, Cl. 433-122.000.

Blumenfeld, Alfred M.: *See—*
Rosofsky, Paul M.; and Blumenfeld, Alfred M., 4,543,679, Cl. 15-110.000.

Board of Regents, The University of Texas, The: *See—*
Weldon, William F.; and Gully, John H., 4,544,874, Cl. 322-10.000.

Board of Trustees, University of Illinois: *See—*
Brown, Theodore L.; and Nubel, Philip O., 4,544,789, Cl. 585-511.000.

Boden, Richard M.: *See—*
Fujoika, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,544,775, Cl. 568-675.000.

Bodine, Albert G. Sonic apparatus for augmenting fluid flow from fluid-bearing strata employing sonic fracturing of such strata. 4,544,031, Cl. 166-177.000.

Boehringer Mannheim GmbH: *See—*
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Ziegenhorn, Joachim; Roder, Albert; Bartl, Knut; and Wehmeyer, Gunter, 4,544,630, Cl. 435-11.000.

Boeing Company, The: *See—*
Brasfield, Robert G., 4,545,020, Cl. 364-509.000.
Folling, Norman D.; and Terrana, Donald B., 4,544,319, Cl. 414-505.000.
Robinson, Curtiss W., 4,544,118, Cl. 244-225.000.

Bofill, Joaquim F.: *See—*
Coll, Juan S.; Bofill, Joaquim F.; and Bacardit, Juan S., 4,543,790, Cl. 60-547.100.

Bohlmeyer, Nicolaas: *See—*
van Baardewijk, Johannes; Bohlmeyer, Nicolaas; and Hartman, Johan E. A., 4,545,050, Cl. 370-62.000.

Boij, Karl O. A. Apparatus for burning spirit or the like liquid fuel. 4,544,348, Cl. 431-146.000.

Boissevain, Mathew, to Measurex Corporation. System for distributing steam on a paper web. 4,543,737, Cl. 34-92.000.

Boliden Aktiebolag: *See—*
Litzen, Karl-Axel, 4,544,095, Cl. 239-8.000.

Bonacchi, Graziano: *See—*
Fedi, Mauro; and Bonacchi, Graziano, 4,544,556, Cl. 514-263.000.

Bonthron, Raymond J.: *See—*
Skakoon, James G.; Johanson, Donald L.; and Bonthron, Raymond J., 4,544,369, Cl. 604-155.000.

Bonvallet, Duane J., to General Motors Corporation. Hypocyclic rolling contact rocker arm and hydraulic lash adjuster pivot. 4,543,920, Cl. 123-90.430.

Booker, Arthur J. Ships propulsion shaft removal apparatus. 4,544,322, Cl. 414-589.000.

Bookwalter, George N., to United States of America, Agriculture. Process for stabilizing whole cereal grains. 4,544,564, Cl. 426-462.000.

Boothman, David R.; and Forde, John C., to General Electric Company. Electrical equipment protection apparatus and method. 4,544,982, Cl. 361-96.000.

Boots, Byron R.; and Lau, Buong P. Solution for cleaning and preserving plastic and metallic surfaces. 4,544,413, Cl. 106-287.140.

Borden, Raymond W., to Allied Corporation. Resettable disconnect device for rotating machines. 4,544,052, Cl. 192-56.00R.

Borgert, Bernhard; and Liche, Udo, to Braas & Co. Sealing strip. 4,544,593, Cl. 428-80.000.

Borgnat, Daniel: *See—*
Chrysostome, Gerard; and Borgnat, Daniel, 4,544,020, Cl. 165-1.000.

Bortfeld, Manfred; Schieber, Eberhard; and Dietzsch, Gunter, to Andreas Stihl. Safety arrangement for a hand-held, power-driven portable tool. 4,543,723, Cl. 30-381.000.

Bosch, Hans: *See—*
Heyland, Sven; Fournet, Gaston; and Bosch, Hans, 4,544,568, Cl. 426-650.000.

Boshinski, Edwin E., to Hobart Corporation. Packaging system. 4,543,766, Cl. 53-64.000.

Bosnjak, Milovan A. Clarifier/thickener. 4,544,487, Cl. 210-522.000.

Bostica, Bruno: *See—*
Belforte, Piero; Bostica, Bruno; Pilati, Luciano; Bovo, Amilcare; and Canato, Luigi, 4,545,051, Cl. 370-66.000.

Bostock, Philip G.; and Holland, Graham J., to Ford Motor Company. Reduction of crankshaft noise from an internal combustion engine. 4,543,924, Cl. 123-195.00A.

Boszormenyi, Istvan: *See—*
Karacsonyi nee Eva Spindler, Belane ; Racz, Bela; Boszormenyi, Istvan; Kiraly, Laszlo ; and Medgyesi, Andras, 4,544,410, Cl. 106-278.000.

Boudreau, Clarence. Climbing device for skis. 4,544,179, Cl. 280-604.000.

Boudreau, Daniel A.: *See—*
Salas, Edward R.; Fisher, Edwin P.; Johnson, Robert B.; Nibby, Chester M., Jr.; and Boudreau, Daniel A., 4,545,010, Cl. 364-200.000.

Boundy, Geoffrey A. Gradient measuring devices. 4,543,731, Cl. 33-375.000.

Bourgeaux, Pierre F. X., to S. A. des Etablissements Staubli (France). Synchronized rotating dobby for weaving looms. 4,544,000, Cl. 139-66.00R.

Bovo, Amilcare: *See—*
Belforte, Piero; Bostica, Bruno; Pilati, Luciano; Bovo, Amilcare; and Canato, Luigi, 4,545,051, Cl. 370-66.000.

Bower, J. David, to American Hoechst Corporation. Extrusion lubricant composition and process. 4,544,694, Cl. 524-385.000.

Bowles, Myron A.: *See—*
Zemke, Edward H., deceased; Pogue, Harold D.; Shah, Girish B.; and Bowles, Myron A., 4,544,146, Cl. 270-58.000.

Bowsky, Benjamin: *See—*
Vogel, Richard E.; and Bowsky, Benjamin, 4,543,797, Cl. 62-193.000.

Box, John W.: *See—*
Arenas, Alvaro; Box, John W.; Davis, Joseph H.; and Tataria, Harshad, 4,544,078, Cl. 220-256.000.

Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., to Commonwealth Aluminum Corporation. Aluminum cell having aluminum wettable cathode surface. 4,544,469, Cl. 204-243.00R.

Boyer, James A.: *See—*
Buttry, Robert C.; and Boyer, James A., 4,544,812, Cl. 200-19.0DC.

Boyesen, Eyvind, to Performance Industries, Inc. Motorcycle drive wheel suspension system. 4,544,044, Cl. 180-227.000.

Braas & Co.: *See—*
Borgert, Bernhard; and Liche, Udo, 4,544,593, Cl. 428-80.000.

Braatvedt, Ian H., to Compagnie Internationale des Pieux Armes Frankignoul. Method for producing in-situ concreted piles with enlarged bases. 4,544,515, Cl. 264-32.000.

Brand, Peter; Lorenzen, Heinz-Christen; Heitmann, Uwe; and Menzel, Peter, to Hauni-Werke Korber & Co. K.G. Method and apparatus for monitoring the diameters of rod-shaped products of the tobacco processing industry. 4,543,816, Cl. 73-37.600.

Brandstrom, Arne E.; and Lamm, Bo R., to Aktiebolaget Hassle. Certain pyridyl-N-oxide intermediates for the preparation of omeprazole. 4,544,750, Cl. 546-290.000.

Branovich, Louis E.; Smith, Bernard; and Freeman, Gerard L., to United States of America, Army. Method or preparing nonlaminating anisotropic boron nitride. 4,544,535, Cl. 423-290.000.

Brasfield, Robert G., to Boeing Company, The. Fuel gaging system. 4,545,020, Cl. 364-509.000.

Bratt, Richard G.: *See—*
Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., 4,545,012, Cl. 364-200.000.

Braungart, Martin, to BBS Kraftfahrzeugtechnik, GmbH+Co. KG. Motor vehicle wheel center including an anti-theft feature. 4,544,209, Cl. 301-37.0AT.

Brayman, Kenneth W.: *See—*
Curulla, Michael V.; Price, John F.; Matzner, Bruce; Brayman, Kenneth W.; and Qurnell, Frank D., 4,544,522, Cl. 376-441.000.

Breashears, Eddie H.: *See—*
Meador, Charles G.; and Breashears, Eddie H., 4,544,416, Cl. 148-1.500.

Breder, E. William, Jr.; Jaecker, John A.; and Johnson, Marvin F. L., to Atlantic Richfield Company. Methane conversion using a magnesia/-silica support. 4,544,786, Cl. 585-500.000.

Breder, E. William, Jr., to Atlantic Richfield Company. Preparative process for supports. 4,544,787, Cl. 585-500.000.

Breeden, John W., to Cuisinarts, Inc. Enlarged food pusher with clean-out windows in a feedtube protector. 4,544,103, Cl. 241-37.500.

Breneman, James C. Method for testing for immune responses to food. 4,543,964, Cl. 128-743.000.

Brenner, Gerhard E. Drapeable decorative sheet material. 4,544,585, Cl. 428-17.000.

Breslow, Jeffrey D.: *See—*
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,544,162, Cl. 273-242.000.
Rasmussen, Russell G.; Peinsipp, Alice A.; and Breslow, Jeffrey D., 4,544,156, Cl. 273-5.00A.

Bretschneider, Hermann: *See—*
Brombacher, Urs; Montavon, Marc; Bretschneider, Hermann; Schantl, Joachim; and Turk, Wolfgang, 4,544,659, Cl. 514-297.000.

Brevick, Arnold A., to Methode Electronics, Inc. Electric switch. 4,544,811, Cl. 200-5 00R.

Bright, David E.; and Jones, Steven K., to Post Office. Detector device for a conveyor. 4,544,841, Cl. 250-221.000.

Bright, John H., to American Cyanamid Company. Extraction of alcohols with phosphine oxides. 4,544,779, Cl. 568-918.000.

Bristol-Myers Company: *See—*
Willis, Donald E., 4,544,073, Cl. 215-246.000.

Britax (Wingard) Limited: *See—*
Cunningham, Douglas J., 4,543,693, Cl. 24-640.000.

Brittain, David R.; and Wood, Robin, to Imperial Chemical Industries. 1'-Substituted-spiro[oxazolidine-5-3'-indoline]-2,2', 4-trione derivatives. 4,544,662, Cl. 514-374.000.

Brock, Alan J.: *See—*
Taylor, Reginald M.; and Brock, Alan J., 4,544,761, Cl. 556-130.000.

Broger, Emil A., to Hoffmann-La Roche Inc. Catalytic hydrogenation. 4,544,770, Cl. 568-9.000.

Brombacher, Urs; Montavon, Marc; Bretschneider, Hermann; Schantl, Joachim; and Turk, Wolfgang, to Hoffman-La Roche Inc. Schistosomicidal acridanone hydrazones. 4,544,659, Cl. 514-297.000.

Bromley, Charles W.; Cooke, Brian A.; and Coombes, Norman A., to Imperial Chemical Industries PLC. Coating compositions. 4,544,686, Cl. 523-411.000.

Brooks, Derrick W.; and Morris, Christopher P. Conditioning apparatus. 4,543,736, Cl. 34-46.000.

Brown, David C., to Cordis Corporation. Data transmission system. 4,543,961, Cl. 128-667.000.

Brown, Richard J., to Eaton Corporation. Mounting shaft and adaptor for viscous coupling. 4,544,054, Cl. 192-58.00B.

Brown, Theodore L.; and Nubel, Philip O., to Board of Trustees, University of Illinois. Stereoselective synthesis of internal olefins. 4,544,789, Cl. 585-511.000.

Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., to Hoffmann-La Roche Inc. Substituted isoquinolines. 4,544,657, Cl. 514-253.000.

Brustle, Klaus: *See—*
Rock, Erich; and Brustle, Klaus, 4,543,686, Cl. 16-288.000.

Brydor Limited: *See—*
Townsend, Lionel B. K.; and Townsend, Mary D., 4,544,899, Cl. 333-17.00R.

Buchanan, Harry C., Jr.; Mack, William R.; and Malhotra, Jagmohan K., to General Motors Corporation. Windshield wiper transmission. 4,543,839, Cl. 74-98.000.

Buchl, Josef. Method of activating an electromagnetic positioning means and apparatus for carrying out the method. 4,544,986, Cl. 361-152.000.

Buchta, William M.: *See—*
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,544,469, Cl. 204-243.00R.

Buckleitner, Thomas H., to Whirlpool Corporation. Solenoid operated neutral pump-out for automatic washer. 4,544,056, Cl. 192-71.000.

Bucklen, Willard K.: *See—*
Chan, Daniel F.; and Bucklen, Willard K., 4,544,914, Cl. 340-347.0AD.

Buckwalter, Brian L.: *See—*
Janusz, John M.; Buckwalter, Brian L.; and LaHann, Thomas R., 4,544,668, Cl. 514-563.000.
LaHann, Thomas R.; Janusz, John M.; and Buckwalter, Brian L., 4,544,669, Cl. 514-563.000.

Budd Company, The: *See—*
Deininger, Harry T., 4,544,822, Cl. 219-120.000.

Buhler, Arthur: *See—*
Schutz, Hans U.; and Buhler, Arthur, 4,544,739, Cl. 534-619.000.

Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, to Buhler, Eugen; and Hutschenreuther AG. Device for the production of molded articles from a pourable substance. 4,544,345, Cl. 425-405.00R.

Bumann, Richard L.; and Chipman, Patrick G., to Burroughs Corporation. Terminal straightener for an integrated circuit package. 4,544,003, Cl. 140-147.000.

Bumgardner, Donald L., to Northern Telecom Limited. Adjustable height support device for a video display unit or the like. 4,544,122, Cl. 248-346.000.

Bunker, James E.; and Fields, Richard P., to Minnesota Mining and Manufacturing Company. Light-curable dentin and enamel adhesive. 4,544,467, Cl. 204-159.240.

Burgdorf, Jochen; and Steffes, Helmut, to ITT Industries, Inc. Power brake unit. 4,543,791, Cl. 6-550.000.

Burger, Bernd: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,544,742, Cl. 544-8.000.

Burnett, Lauren W., to Energy Conservation Innovations, Inc. Electronically controlled fuel injection system for diesel engine. 4,544,096, Cl. 239-92.000.

Burns, Kenneth R.; and Hazel, Robert L., to Burroughs Corporation. Strobe for read/write chain. 4,544,964, Cl. 360-51.000.

Burroughs Corporation: *See—*
Bumann, Richard L.; and Chipman, Patrick G., 4,544,003, Cl. 140-147.000.
Burns, Kenneth R.; and Hazel, Robert L., 4,544,964, Cl. 360-51.000.
Flora, Laurence P., 4,544,882, Cl. 324-73.00R.
LaBudde, Edward V.; and Niven, Jeffrey E., 4,544,241, Cl. 350-486.000.
Lake, Ralph J., Jr.; Steckowich, John, Jr.; and Solomon, Stephen R., 4,544,301, Cl. 403-300.000.

Burroughs Wellcome Co.: *See—*
Krenitsky, Thomas A., 4,544,634, Cl. 435-119.000.

Butler Manufacturing Company: *See—*
Barker, W. David; Heisey, Raymond K., Jr.; and Mariano, Arturo C., 4,543,760, Cl. 52-544.000.

Buttazzoni, Bernard, to Societe Europeenne de Propulsion. Elastically deformable articles of carbon fibers, and method for producing the same. 4,544,599, Cl. 428-262.000.

Butterworth, Edmund M., to Eaton Corporation. Interlocking pushbutton selector switch. 4,544,810, Cl. 200-5.00B.

Butterworth, Edmund M.; and Dennison, William G., to Eaton Corporation. Mechanical interlock for contactors. 4,544,814, Cl. 200-50.00C.

Buttry, Robert C.; and Boyer, James A., to General Motors Corporation. Ignition distributor cap. 4,544,812, Cl. 200-19.0DC.

Byrne, Thomas E. Ball check valve and plate. 4,543,986, Cl. 137-515.700.

C. & E. Fein GmbH & Co.: *See—*
Grunikiewicz, Peter; Gommel, Karl; and Junginger, Klaus M., 4,543,720, Cl. 30-272.00R.

C. R. Bard, Inc.: *See—*
Elliott, Donald P.; and Halseth, William L., 4,544,370, Cl. 604-319.000.
Skakoon, James G.; Johanson, Donald L.; and Bonthron, Raymond J., 4,544,369, Cl. 604-155.000.

C. Reichert Optische Werke AG: *See—*
Schindl, Klaus, 4,544,242, Cl. 350-486.000.

Cadars, Patrick, to Valeo. Sealed joint between a basin and a cover plate. 4,544,029, Cl. 165-149.000.

Cadee, Theodorus P. M.: *See—*
Svab, Eugen; van Deursen, Petrus H.; and Cadee, Theodorus P. M., 4,543,852, Cl. 74-695.000.

Cady, Wayne A., to J. T. Baker Chemical Co. VLSI chemical reactor. 4,544,446, Cl. 156-639.000.

Cairns & Brother Inc.: *See—*
Ehring, Carolyn C., 4,543,670, Cl. 2-85.000.

Calamai, Edward: *See—*
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, 4,544,120, Cl. 248-122.000.

Calgon Corporation: *See—*
Faust, Robert J., 4,544,639, Cl. 436-104.000.
O'Brien, Robert P., 4,544,488, Cl. 210-664.000.

Call, David B., to Atmospheric Instrumentation Research, Inc. Modular cup-type anemometer. 4,543,836, Cl. 73-861.850.

Calmettes, Lionel, to Etablissements Caillau. Hose clamp. 4,543,691, Cl. 24-20.00R.

Calvin, John H.; and Wakasa, Jack Y. Positive locking connector. 4,543,993, Cl. 137-614.030.

Cameron, Richard J.: *See—*
Rhodes, John D.; and Cameron, Richard J., 4,544,901, Cl. 333-212.000.

Campbell, Herbert W.; and Crescuolo, Phillip J., to Canadian Patents and Development Limited. Process and apparatus for controlled addition of conditioning material to sewage sludge. 4,544,489, Cl. 210-709.000.

Camprincoli, Pierpaolo; Marcaccioli, Enzo; and Rosati, Luciano, to Montedison S.p.A. Fibrilled polymeric films as reinforcement in manufactured products based on hydraulic binders. 4,544,606, Cl. 428-454.000.

Canadian Patents and Development Limited: *See—*
Campbell, Herbert W.; and Crescuolo, Phillip J., 4,544,489, Cl. 210-709.000.
Dobrowolski, Jerzy A., 4,543,910, Cl. 118-665.000.

Canato, Luigi: *See—*
Belforte, Piero; Bostica, Bruno; Pilati, Luciano; Bovo, Amilcare; and Canato, Luigi, 4,545,051, Cl. 370-66.000.

Cannella, Vincent D., to Sovonics Solar Systems. Photovoltaic panel having enhanced conversion efficiency stability. 4,544,798, Cl. 136-251.000.

Canon Kabushiki Kaisha: *See—*
Egawa, Akira; and Tokuda, Ryuji, 4,544,254, Cl. 354-403.000.
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, 4,544,580, Cl. 427-261.000.
Kanemitsu, Shinji; and Tohyama, Yoshikuni, 4,544,262, Cl. 355-3.0TR.
Kitajima, Tadayuki; Hayakawa, Kimiaki; Ueda, Noriyoshi; and Hiroi, Masakazu, 4,544,148, Cl. 271-3.100.
Kozuki, Susumu; and Takayama, Makoto, 4,544,959, Cl. 360-33.100.

Momiyama, Kikuo; and Fujibayashi, Kazuo, 4,544,256, Cl. 354-429.000.
Nose, Noriyuki; and Endo, Kiyonobu, 4,544,269, Cl. 356-222.000.
Shigenobu, Michio; and Satomura, Hiroshi, 4,544,828, Cl. 219-216.000.
Shimizu, Seiichi, 4,544,240, Cl. 350-429.000.
Takahashi, Hiroshi, 4,544,893, Cl. 324-433.000.
Tanaka, Kazuo; and Tsuji, Sadahiko, 4,544,250, Cl. 354-199.000.
Watanabe, Yoshitaka; and Endo, Takashi, 4,544,931, Cl. 346-140.00R.

Cappiello, Frank J. Pierced earring locking and holding system. 4,543,804, Cl. 63-12.000.

Carey, Jim A.: *See*—
Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, 4,544,851, Cl. 307-480.000.

Carl Schenck A.G.: *See*—
Schonfeld, Harald; and Bauer, Angelo, 4,543,825, Cl. 73-459.000.

Carl Still GmbH & Co. KG, Firma: *See*—
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,544,451, Cl. 202-114.000.

Carles, Maurice: *See*—
Aubert, Jacques; Bethuel, Louis; and Carles, Maurice, 4,544,531, Cl. 423-19.000.

Carlos, Donald D.: *See*—
Wombles, Robert H.; Carlos, Donald D.; and Gannon, Charles R., 4,544,411, Cl. 106-279.000.

Carlsson, Jan E. K., to KMW ERJO AB. Wood chipper. 4,544,104, Cl. 241-57.000.

Carlsson, Jan E. K., to KMW ERJO AB. Separating device for a wood chipper. 4,544,105, Cl. 241-73.000.

Carroll, Noel. Cyclone separator. 4,544,486, Cl. 210-512.100.

Carson, Douglas T. Engine. 4,543,919, Cl. 123-56.0BC.

Carter, Donald L., to International Business Machines Corporation. Vacuum-to-vacuum entry system apparatus. 4,544,317, Cl. 414-217.000.

Cartmell, James V., to NDM Corporation. Medical electrode assembly. 4,543,958, Cl. 128-640.000.

Casco Products Corporation: *See*—
Lupoli, Peter J.; and Comerford, John J., 4,544,226, Cl. 339-130.00R.

Casey, Don W. Locking cap for oil storage tank. 4,544,076, Cl. 220-210.000.

Castilla, Antonio J. Two hulled motor to sail convertible boat. 4,543,898, Cl. 114-39.000.

Catelli, Camillo, to Rossi & Catelli S.p.A. Plant for bringing about enzyme-deactivation in fruit and vegetables: tomatoes in particular. 4,543,879, Cl. 99-472.000.

Caterpillar Tractor Co.: *See*—
Molnar, John, 4,544,205, Cl. 297-455.000.
Shuler, Lucien B., 4,543,786, Cl. 60-435.000.

Caulfield, Henry J., to Battelle Development Corporation. Method of evaluating a polynomial function using an array of optical modules. 4,544,230, Cl. 350-96.140.

Cavallini, Gianfranco. Modular elements for composing frames for the construction of cabinet structures and containers for electrical, electromechanical and electronic components, for internal and external use. 4,544,069, Cl. 211-183.000.

Cavitt, Michael B.; and Duncan, David J., to Dow Chemical Company, The. Method for preparing advanced epoxy resins. 4,544,731, Cl. 528-89.000.

Cekala, John A. Clip-on chimney hood. 4,543,754, Cl. 52-218.000.

Celanese Corporation: *See*—
Foley, Paul, 4,544,507, Cl. 260-463.000.

Central Glass Company, Limited: *See*—
Sawai, Mithio; Tasaka, Yoshihiro; Kawai, Toshikazu; and Katsuhara, Yutaka, 4,544,772, Cl. 568-411.000.

Ceramic Magnetics, Inc.: *See*—
Schaller, George E., 4,544,803, Cl. 178-18.000.

Cerberus AG: *See*—
Troup, Alan; Strassler, Sigfrid; Guttinger, Hannes; and Pfister, Gustav, 4,543,815, Cl. 73-28.000.

Certified Energy Systems, Inc.: *See*—
Kretchmar, Roy, 4,544,861, Cl. 315-200.00R.

Chan, Daniel F.; and Bucklen, Willard K., to TRW Inc. Asynchronously controllable successive approximation analog-to-digital converter. 4,544,914, Cl. 340-347.0AD.

Chan, David C. K., to Chevron Research Company. Fungicidal N-pyridyloxy alkyl amines. 4,544,661, Cl. 514-345.000.

Chancel, Jean-Louis: *See*—
Plantureux, Alain, 4,543,698, Cl. 29-10.000.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Conversion of oxygenates to hydrocarbons. 4,544,783, Cl. 585-469.000.

Chang, Shih-Chia, to General Motors Corporation. Reactive ion etching of tin oxide films using silicon tetrachloride reactant gas. 4,544,444, Cl. 156-643.000.

Chang, Tiang-Shing: *See*—
Gardella, John M.; Ciepierski, Casimir; Alfano, Michael; and Chang, Tiang-Shing, 4,544,356, Cl. 433-122.000.

Chao, Chien C.; and Sherman, John D., to Union Carbide Corporation. Bulk separation of sorbitol by selective adsorption on zeolitic molecular sieves. 4,544,778, Cl. 568-872.000.

Chao, Paul K.; Knob, Kevin J.; and Yurchak, Sergei, to Mobil Oil Corporation. Control of temperature exotherms in the conversion of methanol to gasoline hydrocarbons. 4,544,781, Cl. 585-408.000.

Chaparral Communications, Inc.: *See*—
Howard, H. Taylor, 4,544,900, Cl. 333-21.00A.

Chapman, Orville L.; and Tsou, Uh-Po E., to University of California, The Regents of the. Thermal styrene formation in the presence of O_2. 4,544,782, Cl. 585-443.000.

Chase, David W., to Bedford, C. Mitchell. Heat accumulator. 4,544,028, Cl. 165-104.140.

Chatterjee, Pallab; Shichijo, Hisashi; and Leiss, John E., to Texas Instruments Incorporated. Contactless tite RAM. 4,545,034, Cl. 365-182.000.

Chattopadhay, Asoke: *See*—
Ehrhart, Fritz; Chattopadhay, Asoke; and Schmidt, Karl, 4,543,939, Cl. 123-533.000.

Chavdarian, Charles G.; and Haag, William G., to Stauffer Chemical Company. S-2-(Carboalkoxyvinyl) trithiophosphonate insecticides. 4,544,651, Cl. 514-120.000.

Chellis, Fred F.; and Moschetto, Samuel J., to Helix Technology Corporation. Electronic control of cryogenic refrigerators. 4,543,793, Cl. 62-6.000.

Chem-Pak, Inc.: *See*—
Duane, George P., Jr., 4,544,578, Cl. 427-140.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Schnurbusch, Horst; and Baltruschat, Helmut, 4,544,402, Cl. 71-93.000.

Chemplex Company: *See*—
Pullukat, Thomas J.; and Hoff, Raymond E., 4,544,646, Cl. 502-109.000.

Chen, Keming J., to RCA Corporation. Television receiver with high voltage protection circuit. 4,544,954, Cl. 358-243.000.

Chersich, Claudio C.: *See*—
Wachs, Israel; and Chersich, Claudio C., 4,544,649, Cl. 502-350.000.

Chevron Research Company: *See*—
Chan, David C. K., 4,544,661, Cl. 514-345.000.
Chin, Thomas G.; and Alston, Arthur, 4,543,819, Cl. 73-64.200.
Kelley, Max D., 4,544,478, Cl. 208-11.00R.
Klaassen, Alan W.; and Bezman, Richard D., 4,544,645, Cl. 502-66.000.
Marcantonio, Paul J., 4,544,533, Cl. 423-67.000.
Zones, Stacey I., 4,544,538, Cl. 423-326.000.

Chi, Chao S., to Sperry Corporation. Triplex digital magnetic recording and reproducing system. 4,544,961, Cl. 360-40.000.

Chianelli, Russell R.: *See*—
Seiver, Robert L.; and Chianelli, Russell R., 4,544,481, Cl. 208-215.000.

Chiappetta, Frank R.: *See*—
Afifi, Mostafa S.; and Chiappetta, Frank R., 4,544,928, Cl. 343-781.00P.

Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,544,751, Cl. 548-127.000.

Chicago Bridge & Iron Company: *See*—
Laverman, Royce J.; and Bertolazzi, Luciano F., 4,543,978, Cl. 137-255.000.

Chin, Danny, to RCA Corporation. Auto-tint circuit for a TV receiver. 4,544,944, Cl. 358-28.000.

Chin, Thomas G.; and Alston, Arthur, to Chevron Research Company. Vapor-liquid ratio analyzer. 4,543,819, Cl. 73-64.200.

Ching, Dennis T.: *See*—
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,011, Cl. 364-200.000.
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,013, Cl. 364-200.000.

Chipman, Patrick G.: *See*—
Bumann, Richard L.; and Chipman, Patrick G., 4,544,003, Cl. 140-147.000.

Choderker, Nathan; Dorman, Carl E.; Richter, Ian; and Driver, Richard. Coin acceptor. 4,544,058, Cl. 194-102.000.

Choi, In K. Method and apparatus for tidal electric power generation using the buoyancy energy of the tide. 4,544,849, Cl. 290-53.000.

Chou, Eddie C.; Wiegers, Ben W.; Huggins, Dale K.; and Wiewiorowski, Edward I., to AMAX Inc. Removal of hexavalent selenium from nickel, cobalt or copper sulfate solution. 4,544,541, Cl. 423-508.000.

Christensen, Burton G.: *See*—
Andrus, W. Alexander; Christensen, Burton G.; and Heck, James V., 4,544,557, Cl. 514-210.000.

Christensen, Carl W.; and Isaacson, Calvin, to Shipley Company Inc. Photosensitive laminate. 4,544,619, Cl. 430-258.000.

Christolini, Ben A., Jr.: *See*—
Griswold, Charles F.; and Christolini, Ben A., Jr., 4,543,894, Cl. 110-347.000.

Chrysostome, Gerard; and Borgnat, Daniel, to Creusot-Loire. Method of regulating the heat transfer coefficient of a heat exchanger and improved heat exchanger for practicing said method. 4,544,020, Cl. 165-1.000.

Chu, Wei-Kan; Pliskin, William A.; and Riseman, Jacob, to International Business Machines Corporation. Deep dielectric isolation by fused glass. 4,544,576, Cl. 427-82.000.

Chuo Hatsujo Kabushiki Kaisha: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,544,406, Cl. 75-123.00N.

Ciba-Geigy Corporation: *See*—
Audykowski, Thaddeus; Mentha, Anton; and Losert, Ewald, 4,544,623, Cl. 430-280.000.

Della Casa, Angelo; and Aeschlimann, Peter, 4,544,373, Cl. 8-639.000.
Dexter, Martin; and Winter, Roland A. E., 4,544,691, Cl. 524-99.000.
Holtje, Wilfried G., 4,544,746, Cl. 546-103.000.
Roth, Martin, 4,544,621, Cl. 430-271.000.
Schutz, Hans U.; and Buhler, Arthur, 4,544,739, Cl. 534-619.000.
Zinke, Horst; and Schumacher, Rolf, 4,544,492, Cl. 252-32.70E.

Ciepierski, Casimir: *See*—
Gardella, John M.; Ciepierski, Casimir; Alfano, Michael; and Chang, Tiang-Shing, 4,544,356, Cl. 433-122.000.

CII Honeywell Bull (Societe Anonyme): *See*—
Ugon, Michel, 4,544,833, Cl. 235-379.000.

Cirillo, Gianna: *See*—
Moggi, Giovanni; and Cirillo, Gianna, 4,544,708, Cl. 525-337.000.

Citizen Watch Co., Ltd.: *See*—
Ode, Sadao; Hatsuse, Toshikazu; and Shiina, Hiroshi, 4,543,692, Cl. 24-616.000.
Shiba, Kazuo; and Miyashita, Masakazu, 4,543,724, Cl. 33-1.00N.
Suzuki, Hirofumi; Waki, Masahiko; and Harada, Kunimitsu, 4,544,288, Cl. 400-121.000.

Claas Saulgau GmbH: *See*—
Arnold, Rudolf, 4,543,774, Cl. 56-98.000.

Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., to Data General Corporation. Access control system for use in a digital computer system with object-based addressing and call and return operations. 4,545,012, Cl. 364-200.000.

Clarke, Rowland C.; and Eldridge, Graeme W., to Westinghouse Electric Corp. Transient capless annealing process for the activation of ion implanted compound semiconductors. 4,544,417, Cl. 148-1.500.

Claude, S.A.: *See*—
Serrie, Gerard J. J.; and Huvet, Jean-Marie, 4,544,980, Cl. 361-45.000.

Claussen, Uwe; and Harnisch, Horst, to Bayer Aktiengesellschaft. Light-collecting system using coumarin derivatives as energy converters. 4,544,496, Cl. 252-301.350.

Claussen, Uwe; Hannes, Hellmut; and Weber, Hans-Leo, to Bayer Aktiengesellschaft. Birefringence-free plastics. 4,544,583, Cl. 428-1.000.

Claypro Associates: *See*—
Tyson, William H.; and Stuart, Frank A., 4,544,491, Cl. 210-772.000.

Cleland, Robert K. Beverage dispenser. 4,544,084, Cl. 222-56.000.

Clements, Jack W.; and Faulkner, John R., to Westinghouse Electric Corp. Calibration of automated laser machining apparatus. 4,545,018, Cl. 364-474.000.

Clemmons, Quentin T.; and Czerniewski, Paul F., to American Standard Inc. Spring-applied, air-released, slack-adjusting parking brake. 4,544,047, Cl. 188-170.000.

Clemmons, Richard R.; Zimmer, Darrel E.; and Sanders, Stephen H., III, to Amerock Corporation. Remote window operating system. 4,544,866, Cl. 318-54.000.

Cliffton, Michael D.: *See*—
Geibel, Jon F.; Cliffton, Michael D.; and Murtha, Timothy P., 4,544,735, Cl. 528-374.000.

Cobb, David A.; and Miszczak, Frank L., to Felt Products Mfg. Co. Manufactured precompressed gasket assembly with embedded wire ring and locally densified sheet members. 4,544,169, Cl. 277-235.00B.

Coca-Cola Company, The: *See*—
Credle, William S., Jr., 4,544,328, Cl. 417-33.000.

Codenoll Technology Corporation: *See*—
Scholl, Frederick, 4,544,938, Cl. 357-30.000.

Coe, Charles G.; and Kuznicki, Steven M., to Air Products and Chemicals, Inc. Nitrogen adsorption process. 4,544,378, Cl. 55-68.000.

Coe, Frederick L.: *See*—
Dormandy, Ray H., Jr.; and Coe, Frederick L., 4,544,371, Cl. 604-891.000.

Coffey, D. Michael: *See*—
Ennis, Robert M., Jr.; Coffey, D. Michael; and McGhee, R. Wayne, 4,544,979, Cl. 361-19.000.

Cogan, Adrian I.: *See*—
Bencuya, Izak; and Cogan, Adrian I., 4,543,706, Cl. 29-571.000.

Cohen, Marc M., to United States of America, National Aeronautics and Space Administration. Laboratory glassware rack for seismic safety. 4,544,068, Cl. 211-74.000.

Coleman, Michael J.: *See*—
Anderson, James E.; Coleman, Michael J.; and Livermore, Frederick C., 4,544,983, Cl. 361-119.000.

Colgate-Palmolive Company: *See*—
Silvis, Salvatore J., 4,544,493, Cl. 252-89.100.
Trenner, Hans-Herbert, 4,544,006, Cl. 141-105.000.

Coll, Juan S.; Bofill, Joaquim F.; and Bacardit, Juan S., to Bendiberica, S.A. Master cylinder and brake booster assembly. 4,543,790, Cl. 60-547.100.

Collier, John E., to Leeds & Northrup Company. Remote correlation of sequence of events. 4,545,029, Cl. 364-900.000.

Collins, Dean E., to Root-Lowell Mfg., Co. Shut-off valve for a sprayer. 4,544,133, Cl. 251-344.000.

Colombo, John W.: *See*—
Meissner, Konrad E.; and Colombo, John W., 4,544,005, Cl. 141-94.000.

Columbus Foundries, Inc.: *See*—
Dugger, Ben A., 4,544,188, Cl. 285-337.000.

Comerford, John J.: *See*—
Lupoli, Peter J.; and Comerford, John J., 4,544,226, Cl. 339-130.00R.

Commissariat a l'Energie Atomique: *See*—
Aubert, Jacques; Bethuel, Louis; and Carles, Maurice, 4,544,531, Cl. 423-19.000.
Jeuch, Pierre; Lazzari, Jean-Pierre; and Parrens, Pierre, 4,544,445, Cl. 156-643.000.
Juvin, Didier; and Dupeyrat, Benoit, 4,545,067, Cl. 382-21.000.

Commonwealth Aluminum Corporation: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,544,469, Cl. 204-243.00R.

Compagnie Internationale des Pieux Armes Frankignoul: *See*—
Braatvedt, Ian H., 4,544,515, Cl. 264-32.000.

Computer Identification Systems: *See*—
Parkinson, Dean B., 4,544,183, Cl. 283-85.000.

Concoco Inc.: *See*—
Miller, Thomas R., 4,544,208, Cl. 299-12.000.

Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, to Texas Instruments Incorporated. Synchronizer circuit with dual input. 4,544,851, Cl. 307-480.000.

Consolidation Coal Company: *See*—
Podobinski, David J., 4,544,978, Cl. 361-4.000.

Constant, Jennifer: *See*—
Abdullah, Hilal M.; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Toyne, Kenneth J., 4,544,497, Cl. 252-299.500.

Continental Emsco Company: *See*—
Richardson, Eugene M., 4,545,017, Cl. 364-422.000.

Cook, George E., to CRC Welding Systems, Inc. Adaptive control system for welding inverted seams. 4,544,825, Cl. 219-137.00R.

Cook International, Inc.: *See*—
Hill, James J.; and Marven, Al, 4,544,086, Cl. 222-649.000.

Cook, William A.; Fearnot, Neal E.; and Geddes, Leslie A., to Purdue Research Foundation. Exercise responsive cardiac pacemaker. 4,543,954, Cl. 128-419.0PG.

Cooke, Arthur V.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,544,469, Cl. 204-243.00R.

Cooke, Brian A.: *See*—
Bromley, Charles W.; Cooke, Brian A.; and Coombes, Norman A., 4,544,686, Cl. 523-411.000.

Coombes, Norman A.: *See*—
Bromley, Charles W.; Cooke, Brian A.; and Coombes, Norman A., 4,544,686, Cl. 523-411.000.

Coone, Malcolm G., to Xenpax, Inc. Inflatable packer. 4,544,165, Cl. 277-34.000.

Cooper, Arthur; and Mailliet, Pierre, to Paul Wurth, S.A. Taphole plugging apparatus for a shaft furnace. 4,544,143, Cl. 266-273.000.

Cooper Lasersonics, Inc.: *See*—
Munnerlyn, Charles R., 4,544,243, Cl. 350-514.000.

Copeland Corporation: *See*—
Lorson, E. William, 4,543,989, Cl. 137-543.190.

Corbett, John M.; and Neumann, Fred W., to Dow Chemical Company, The. Polymeric compositions possessing improved flammability resistance. 4,544,682, Cl. 521-142.000.

Cordis Corporation: *See*—
Arenas, Alvaro; Box, John W.; Davis, Joseph H.; and Tataria, Harshad, 4,544,078, Cl. 220-256.000.
Brown, David C., 4,543,961, Cl. 128-667.000.
DeHaan, Abel, 4,544,613, Cl. 429-91.000.
Herscovici, Harry, 4,543,956, Cl. 128-419.0PG.
Schroeppel, Edward A., 4,543,955, Cl. 128-635.000.
Slocum, Chester D.; and Cutolo, Vincent T., 4,543,953, Cl. 128-419.0PT.

Corley, Larry S., to Shell Oil Company. Heat-curable composition. 4,544,732, Cl. 528-90.000.

Cornell Research Foundation, Inc.: *See*—
Horodeck, Richard A., 4,544,276, Cl. 400-110.000.
Rizvi, Syed S. H., 4,543,735, Cl. 34-15.000.

Cosgrove, Eunice M. Post support and protector. 4,543,757, Cl. 52-295.000.

Coulaloglou, Costas A.: *See*—
Siegell, Jeffrey H.; and Coulaloglou, Costas A., 4,543,733, Cl. 34-1.000.

Couture, William F., to IBP, Inc. Method and apparatus for removing cheek meat from the skulls of slaughtered animals. 4,543,689, Cl. 17-46.000.

Cover, Craig H. Lighting fixture insulating system. 4,544,992, Cl. 362-147.000.

Cowan, Kiplin D., to Phillips Petroleum Company. Diacyloxyolefins are hydrogenated in presence of alkali and alkaline earth metal salts of carboxylic acids. 4,544,767, Cl. 560-263.000.

Cox, Hoy L. Feedyard sweeper. 4,543,678, Cl. 15-56.000.

Cramer, Russell L.: *See*—
Stuparits, Jeffrey J.; and Cramer, Russell L., 4,544,809, Cl. 179-175.20R.

Crandall, Robert E., to Rexnord Inc. Belt press. 4,544,061, Cl. 198-813.000.

Crandell, Stephen L., to PPG Industries, Inc. Curtainwall system. 4,543,755, Cl. 52-235.000.

Crane, David O., to Crane Electronics, Limited. Torque transducing systems for impact tools and impact tools incorporating such systems. 4,544,039, Cl. 173-12.000.

Crane Electronics, Limited: *See—*
Crane, David O., 4,544,039, Cl. 173-12.000.

Crane, Hewitt D.; and Kelly, Donald H., to SRI International. System for producing selective stabilization of a portion of the retinal image. 4,544,246, Cl. 351-211.000.

Cranston, Dean H.; and Myers, Charles M., to Eaton Corporation. Printer apparatus and cutting mechanism. 4,544,293, Cl. 400-320.000.

CRC Welding Systems, Inc.: *See—*
Cook, George E., 4,544,825, Cl. 219-137.00R.

Credle, William S., Jr., to Coca-Cola Company, The. Sold-out device for syrup pump. 4,544,328, Cl. 417-33.000.

Cremers, David A.; and Keller, Richard A., to United States of America, Energy. Apparatus and method for measurement of weak optical absorptions by thermally induced laser pulsing. 4,544,274, Cl. 356-436.000.

Crescent Metal Products Inc.: *See—*
Baggott, George T., 4,544,024, Cl. 165-48.00R.

Crescuolo, Phillip J.: *See—*
Campbell, Herbert W.; and Crescuolo, Phillip J., 4,544,489, Cl. 210-709.000.

Creusot-Loire: *See—*
Chrysostome, Gerard; and Borgnat, Daniel, 4,544,020, Cl. 165-1.000.

Critikon, Inc.: *See—*
Medero, Richard; Hood, Rush W.; Apple, Howard P.; and Ramsey, Maynard, III, 4,543,962, Cl. 128-682.000.

Crook, Mikel S.; and Decker, Douglas E., to American Standard Inc. Shell nozzle. 4,544,030, Cl. 165-159.000.

Crouzet: *See—*
Saroul, Jacques, 4,544,881, Cl. 324-73.0PC.

Crucible Materials Corporation: *See—*
McCollough, William L.; and Wulczynski, Frank J., 4,544,523, Cl. 419-8.000.
Yolton, Charles F.; and Moll, John H., 4,544,404, Cl. 75-0.50C.

Cryomagnetics, Inc.: *See—*
Ennis, Robert M., Jr.; Coffey, D. Michael; and McGhee, R. Wayne, 4,544,979, Cl. 361-19.000.

Cselt Centro Studi E Laboratori: *See—*
Belforte, Piero; Bostica, Bruno; Pilati, Luciano; Bovo, Amilcare; and Canato, Luigi, 4,545,051, Cl. 370-66.000.

CTS Corporation: *See—*
Seffernick, Lewis L.; and Trobridge, Gary W., 4,543,714, Cl. 29-845.000.

Cuijpers, Mathias J. M., to SKF Industrial Trading Development Co. B.V. Shaft seal in the shape of an elliptical funnel. 4,544,164, Cl. 277-25.000.

Cuisinarts, Inc.: *See—*
Breeden, John W., 4,544,103, Cl. 241-37.500.

Cummins-Allison Corporation: *See—*
Rasmussen, James M., 4,543,969, Cl. 133-3.00A.

Cunningham, Douglas J., to Britax (Wingard) Limited. Safety belt buckles. 4,543,693, Cl. 24-640.000.

Curtin, Thomas B.: *See—*
Sorrell, Furman Y.; Curtin, Thomas B.; and Feezor, Michael D., 4,543,822, Cl. 73-170.00A.

Curtis Hockey Inc.: *See—*
Curtis, Martin D., 4,544,157, Cl. 273-67.00A.

Curtis, Martin D., to Curtis Hockey Inc. Goalkeeper's hockey stock with bent shaft. 4,544,157, Cl. 273-67.00A.

Curulla, Michael V.; Price, John F.; Matzner, Bruce; Brayman, Kenneth W.; and Qurnell, Frank D., to General Electric Company. Nuclear fuel assembly spacer. 4,544,522, Cl. 376-441.000.

Cusack, Robert F., to GTE Valeron Corporation. Probe adjustment tool and method of using same. 4,543,859, Cl. 81-484.000.

Cusick, Joseph B., III, to Tweco Products, Inc. Welding power conductor assembly. 4,544,827, Cl. 219-137.630.

Cutie , Sergio S.: *See—*
Knee, William R.; and Cutie , Sergio S., 4,544,768, Cl. 564-206.000.

Cutler, Orvid R.: *See—*
Zentner, Mark R.; and Cutler, Orvid R., 4,543,777, Cl. 57-295.000.

Cutolo, Vincent T.: *See—*
Slocum, Chester D.; and Cutolo, Vincent T., 4,543,953, Cl. 128-419.0PT.

Czeininger, Csaba: *See—*
Gyurko, Istvan; Czeininger, Csaba; Mosko, Karoly; and Nagy, Ferenc, 4,544,676, Cl. 521-84.100.

Czerniewski, Paul F.: *See—*
Clemmons, Quentin T.; and Czerniewski, Paul F., 4,544,047, Cl. 188-170.000.

Daikin Kogyo Co., Ltd.: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Shimizu, Yoshiki, 4,544,720, Cl. 526-247.000.

Daimler-Benz Aktiengesellschaft: *See—*
Schmidt, Manfred; Trube, Hans; and Pfeiffer, Martin, 4,544,197, Cl. 296-84.00R.
von Hiddessen, Gotz; and Wachtel, Dieter, 4,543,853, Cl. 74-713.000.

Daisy Systems Holland B.V.: *See—*
Schuiling, Theodorus A.; and Morsing, Gijsbertus B., 4,544,290, Cl. 400-175.000.

Dal Poz, Giuseppe: *See—*
Fugazza, Ermanno; and Dal Poz, Giuseppe, 4,543,922, Cl. 123-179.00S.

Damiano, Ralph R.; and Whitney, Charles A., to Wiremold Company, The. Method and apparatus for electrical connection of flat cables. 4,543,716, Cl. 29-871.000.

Damiens, Bernard J. A. Cool beverage carafe server. 4,543,801, Cl. 62-457.000.

Danckert, Hermann, to Volkswagenwerk Aktiengesellschaft. Traction- and pressure-transmitting link joint between two structural components executing joint movements. 4,544,299, Cl. 403-150.000.

Dang Vu, Quang; Fradel, Claude; Euzen, Jean-Paul; and Le Page, Jean-Francois, to Institut Francais du Petrole. Plate reactors for chemical syntheses under high pressure in gaseous phase and with heterogeneous catalysis. 4,544,544, Cl. 423-659.000.

Data General Corporation: *See—*
Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., 4,545,012, Cl. 364-200.000.

Daussan, Andre : *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre , 4,544,409, Cl. 106-18.140.

Daussan et Compagnie: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre , 4,544,409, Cl. 106-18.140.

Daussan, Gerard: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre , 4,544,409, Cl. 106-18.140.

Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre , to Daussan et Compagnie. Coating for protecting constructions, particularly against heat and fire. 4,544,409, Cl. 106-18.140.

Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., to Schering A.G. Substituted sulfonamidobenzamides, antiarrhythmic agents and compositions thereof. 4,544,654, Cl. 514-210.000.

Davey, Ernest: *See—*
Hidler, Henry; Davey, Ernest; Hope, Lawrence L.; and Shimer, Robert, 4,544,091, Cl. 228-124.000.

David, Constant V. Water saving insert for toilet tank. 4,543,674, Cl. 4-415.000.

Davidovitch, Jecheskel. Driving mechanism for vehicle propelled by human muscle power. 4,544,174, Cl. 280-255.000.

Davidson, John J.: *See—*
Heffner, Robert E.; and Davidson, John J., 4,544,475, Cl. 204-300.0EC.

Davidson, Robert I., to Ethyl Corporation. Aryl coupling process. 4,544,509, Cl. 260-465.00G.

Daviduk, Nicholas; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corporation. Control system for catalytic conversion of olefins to heavier hydrocarbons. 4,544,788, Cl. 585-501.000.

Davis, Ann C.: *See—*
Keggins, Kathleen M.; Davis, Ann C.; Sybert, Edward M.; Mays, Thomas D.; and Milch, Robert A., 4,544,637, Cl. 435-253.000.

Davis, Joseph H.: *See—*
Arenas, Alvaro; Box, John W.; Davis, Joseph H.; and Tataria, Harshad, 4,544,078, Cl. 220-256.000.

Davis, Lorne A., Jr., to Texaco Inc. Method and apparatus for measuring relative permeability and water saturation of a core. 4,543,821, Cl. 73-153.000.

Davis, Michael A.: *See—*
Ryan, Patrick J.; Davis, Michael A.; and Melchior, Donald L., 4,544,545, Cl. 424-1.100.

Davis, Paul J.; and Reynolds, James F., to Internationale Octrooi Maatschappij "Octropa" B.V. Method for the control of coccidiosis in poultry. 4,544,548, Cl. 424-93.000.

Davis, Robert C., to Harris Corporation. Diode-configured Viterbi algorithm error correcting decoder for convolutional codes. 4,545,054, Cl. 371-43.000.

Davoli, Velmore: *See—*
Mayr, Adolfe; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettoro, 4,544,717, Cl. 526-125.000.

De Forenede Bryggerier A/S: *See—*
Mernoe, Erik C., 4,544,059, Cl. 198-453.000.

De Aguirre-Otegui, Ignacio: *See—*
Lambert, Pierre M.; and De Aguirre-Otegui, Ignacio, 4,544,743, Cl. 544-64.000.

Deasy, Richard E.: *See—*
Spinks, R. Joe, Jr.; Snider, Glenn R.; and Deasy, Richard E., 4,545,059, Cl. 375-1.000.

DeBernardi, James A.: *See—*
Ware, Joseph W., III; DeBernardi, James A.; and Holcomb, James R., 4,544,350, Cl. 431-285.000.

De Berraly, Jean-Marie: *See—*
Dumoulin, Joseph; and De Berraly, Jean-Marie, 4,544,684, Cl. 523-136.000.

Deborde, Albert H.; and Grandvallet, Gilles, to Saurer Diederichs. Sequential cleaning device for a loom. 4,543,999, Cl. 139-1.00C.

deButts, Harry A., II, to Syscon Corporation. Mounting for caboose replacement signal transmitting unit. 4,544,124, Cl. 248-552.000.

Decker, Douglas E.: *See—*
Crook, Mikel S.; and Decker, Douglas E., 4,544,030, Cl. 165-159.000.

Deere & Company: *See—*
Reilly, Roger D., 4,543,773, Cl. 56-13.600.

DeHaan, Abel, to Cordis Corporation. Electrochemical cell having continuous depletion gauge. 4,544,613, Cl. 429-91.000.

De Haan, Gerard, to U.S. Philips Corporation. Analog-to-digital conversion circuit. 4,544,918, Cl. 340-347.0AD.

Deichmiller, Arthur C.: *See*—
Miller, Gary E.; Mesiya, Mohammed F.; and Deichmiller, Arthur C., 4,545,075, Cl. 155-612.000.
Deininger, Harry T., to Budd Company, The. Electrode holder for a resistance welding gun. 4,544,822, Cl. 219-120.000.
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, to Institut Mondial du Phosphate. Polychlorophosphazenes and process for their preparation. 4,544,536, Cl. 423-300.000.
Della Casa, Angelo; and Aeschlimann, Peter, to Ciba-Geigy Corporation. 2,4-Dinitro-2'-acylamino-4'-dialkylamino-5'-alkoxy-alkyleneoxy-1,1'-azobezene dyes. 4,544,373, Cl. 8-639.000.
Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corporation. Process for the resolution of pyrano[3,4-b]indole-1-acetic acids. 4,544,757, Cl. 548-432.000.
Deneke, Ulfert: *See*—
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Denman, Stephen A.; and Powell, Jack J., to Deuer, Joseph; and Deuer, James. Tire lift/carrier. 4,544,136, Cl. 254-323.000.
Dennison, William G.: *See*—
Butterworth, Edmund M.; and Dennison, William G., 4,544,814, Cl. 200-50.00C.
Denny, Alan, to Management Assistance, Inc. Ejector latch. 4,544,217, Cl. 339-17.00M.
Depor Industries: *See*—
Pelloski, Peter E., 4,544,581, Cl. 427-383.700.
DeSantis, Gennaro, to Rockwell-Rimoldi S.p.A. Device for adjusting the trajectory of the upper looper in an overlocking sewing machine. 4,543,896, Cl. 112-162.000.
Desfontaines, Guy: *See*—
Millot, Jean-Paul; Desfontaines, Guy; and Babin, Michel, 4,544,521, Cl. 376-209.000.
Designs for Vision, Inc.: *See*—
Goldman, David A., 4,544,953, Cl. 358-227.000.
DeSoto, Inc.: *See*—
Zentner, Mark R.; and Cutler, Orvid R., 4,543,777, Cl. 57-295.000.
Detroit Marine Engineering, Inc.: *See*—
Wrigley, Robert A., 4,544,199, Cl. 297-244.000.
Deuer, James: *See*—
Denman, Stephen A.; and Powell, Jack J., 4,544,136, Cl. 254-323.000.
Deuer, Joseph: *See*—
Denman, Stephen A.; and Powell, Jack J., 4,544,136, Cl. 254-323.000.
Deutsche Texaco Aktiengesellschaft: *See*—
Osterburg, Gunther; and Prezelj, Milan, 4,544,776, Cl. 568-697.000.
Dev-Mark, Inc.: *See*—
Fritz, William E., 4,543,889, Cl. 105-377.000.
DeVeau, George F., Jr.; and Miller, Calvin M., to AT&T Bell Laboratories. Low loss optical fiber splicing. 4,544,234, Cl. 350-96.210.
Development Finance Corporation of New Zealand: *See*—
Law, David, 4,543,687, Cl. 16-388.000.
DeVera, Nedie L., to Uniroyal, Inc. Modified ionic elastomer and blend with nylon. 4,544,702, Cl. 525-66.000.
Devine Lighting: *See*—
Nagel, Robert, 4,545,007, Cl. 362-329.000.
Devrient, Ludwig: *See*—
Maurer, Thomas; Gauch, Wolfgang; and Devrient, Ludwig, 4,544,181, Cl. 283-74.000.
Dexter, Martin; and Winter, Roland A. E., to Ciba-Geigy Corporation. Compositions containing ultraviolet-absorbing stabilizing substituted by an aliphatic hydroxyl group. 4,544,691, Cl. 524-99.000.
Diamond, Craig J.: *See*—
Tegeler, John J.; and Diamond, Craig J., 4,544,753, Cl. 548-245.000.
Didier, Donald: *See*—
Wright, Philip M.; and Didier, Donald, 4,544,080, Cl. 220-359.000.
Didier-Werke AG: *See*—
Kunnecke, Manfred, 4,543,893, Cl. 110-338.000.
Diebold, Incorporated: *See*—
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., 4,544,149, Cl. 271-107.000.
Diehl GmbH & Co.: *See*—
Meisner, Alfred; and Lunz, Alfred-Gunther, 4,544,813, Cl. 200-38.00R.
Dien, Rene; and Poulain, Guy, to Rhone-Poulenc Specialites Chimiques. Storage-stable thermosetting compositions comprising imido prepolymers. 4,544,728, Cl. 528-21.000.
Diepholz, Tilo; Hapke, Walter; Wohl, Wilhelm; and Schindler, H.-Joachim, to Blaupunkt Werke GmbH. Automatic preferred direction selection for a bidirectional tape transport. 4,544,965, Cl. 360-71.000.
Diesel Kiki Company, Ltd.: *See*—
Aoki, Fujio; and Koike, Kazumi, 4,544,097, Cl. 239-126.000.
Shibuya, Tsunenori, 4,544,331, Cl. 417-269.000.
Shibuya, Tsunenori, 4,544,332, Cl. 417-269.000.
Dietiker, Paul; Kim, Yong C.; Nelson, Marvin D.; and Olson, Elwyn H., to Honeywell Inc. Gas valve with combined manual and automatic operation. 4,543,974, Cl. 137-66.000.
Dietzsch, Gunter: *See*—
Bortfeld, Manfred; Schieber, Eberhard; and Dietzsch, Gunter, 4,543,723, Cl. 30-381.000.
Dinnissen, Johannes H. A., to Oce-Nederland B.V. Apparatus for feeding sheets one by one. 4,544,147, Cl. 271-35.000.
Di Nunzio, Vittorio, to Fiat Auto S.p.A. Fuel consumption signalling device for a motor vehicle. 4,544,909, Cl. 340-52.00R.
Director-General of Agency of Industrial Science and Technology: *See*—
Okado, Hideo; Hashimoto, Kazuo; Kawamura, Kichinari; Yamazaki, Yasuyoshi; and Takaya, Haruo, 4,544,793, Cl. 585-640.000.
Dixon, Samuel, Jr., to United States of America, Army. Millimeter wave image guide band reject filter and mixer circuit using the same. 4,545,073, Cl. 455-325.000.
Dobashi, Akihiko; Ohta, Tomohisa; Himori, Hirotsugu; and Sekine, Hideo, to Hitachi Chemical Company, Ltd. Process for curing radiation curable coating media. 4,544,573, Cl. 427-44.000.
Dobrowolski, Jerzy A., to Canadian Patents and Development Limited. Vapor deposition regulating apparatus. 4,543,910, Cl. 118-665.000.
Dodson, Stuart A.: *See*—
Studt, William L.; Dodson, Stuart A.; Zimmerman, Harry K.; and Barnes, James L., 4,544,670, Cl. 514-617.000.
Doggett, Fred F.: *See*—
Swank, Harry R.; Doggett, Fred F.; Huyler, Lee E.; and Sofia, Santo J., 4,544,955, Cl. 358-246.000.
Dolphin Titan International, Inc.: *See*—
Albaugh, E. Kurt, 4,544,135, Cl. 254-108.000.
Dominico, James W.: *See*—
Skrypek, John P.; Williams, Robert; Dominico, James W.; and Rohr, Albin, 4,543,883, Cl. 101-38.00A.
Donovan, James E. Puppet. 4,544,365, Cl. 446-73.000.
Dorman, Carl E.: *See*—
Choderker, Nathan; Dorman, Carl E.; Richter, Ian; and Driver, Richard, 4,544,058, Cl. 194-102.000.
Dormandy, Ray H., Jr.; and Coe, Frederick L., to American Hospital Supply Corporation. Implantable metered dose drug delivery system. 4,544,371, Cl. 604-891.000.
Dorn, Hubert: *See*—
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.
Dorr-Oliver Incorporated: *See*—
Angevine, Peter A.; Bengtsson, Sune; and Koudijs, George P., 4,544,542, Cl. 423-555.000.
Dorsey, Edmund. Jewelry clutch. 4,543,695, Cl. 24-662.000.
Dostmann GmbH & Co. KG: *See*—
Marterer, Karl, 4,543,824, Cl. 73-386.000.
Dover Corporation: *See*—
Olmsted, Daniel C.; and Kroll, Quin D., 4,543,979, Cl. 137-315.000.
Dow Chemical Company, The: *See*—
Cavitt, Michael B.; and Duncan, David J., 4,544,731, Cl. 528-89.000.
Corbett, John M.; and Neumann, Fred W., 4,544,682, Cl. 521-142.000.
Finch, Charles R.; Wallace, Leslie E.; and Evans, Thomas E., 4,544,706, Cl. 525-146.000.
Fuentes, Ricardo, Jr.; and Esneault, Calvin P., 4,544,647, Cl. 502-115.000.
Hefner, Robert E., Jr., 4,544,704, Cl. 525-108.000.
Knee, William R.; and Cutie , Sergio S., 4,544,768, Cl. 564-206.000.
Pickelman, Dale M.; and Yats, Larry D., 4,544,697, Cl. 524-458.000.
Dow Corning Corporation: *See*—
Benjamin, Kelly L., 4,544,582, Cl. 427-407.100.
Lee, Chi-Long; and Rabe, James A., 4,544,681, Cl. 521-134.000.
Dowa Seishi Co., Ltd.: *See*—
Sawamura, Mamoru, 4,544,011, Cl. 160-84.00R.
Downey, Gale D.; and Jones, Charles E., to FMC Corporation. Homogeneous laundry detergent slurries containing amphoteric surface-active agents. 4,544,494, Cl. 252-135.000.
Downs Surgical PLC: *See*—
Islam, Abul B. M. A.; and Bevan, David R., 4,543,966, Cl. 128-754.000.
Doyle, Walter M., to Laser Precision Corporation. Alignment apparatus and method for interferometer spectrometers. 4,544,272, Cl. 356-346.000.
Drabowitch, Serge; and Leterrier, Guy, to Thomson-CSF. Assembly of main and auxiliary electronic scanning antennas and radar incorporating such an assembly. 4,544,925, Cl. 343-18.00E.
Drake, Anthony F.; Masse, Fernard J.; and Grendahl, Dennis T., to Surgidev Corporation. Vaulted intraocular lens. 4,543,673, Cl. 623-6.000.
Drake, Charles A., to Phillips Petroleum Company. Dimerization process and catalysts therefor. 4,544,790, Cl. 585-516.000.
Drapala, Thaddeus R.; and Zaman, Mohammad K., to Lockheed Corporation. Electro-optical data bus. 4,545,077, Cl. 455-612.000.
Dresser Industries, Inc.: *See*—
Ferguson, Walter J., 4,543,833, Cl. 73-741.000.
Fraser, Teresa M., 4,544,643, Cl. 501-127.000.
Patel, Arvind D., 4,544,756, Cl. 548-354.000.
Drexler, Jerome, to Drexler Technology Corporation. Data system containing a high capacity optical contrast laser recordable wallet-size plastic card. 4,544,835, Cl. 235-487.000.
Drexler Technology Corporation: *See*—
Drexler, Jerome, 4,544,835, Cl. 235-487.000.
Driver, Richard: *See*—
Choderker, Nathan; Dorman, Carl E.; Richter, Ian; and Driver, Richard, 4,544,058, Cl. 194-102.000.
Duane, George P., Jr., to Chem-Pak, Inc. Method of touching up surface-blemished matt-finished surface grained colored molded plastic parts. 4,544,578, Cl. 427-140.000.

Duckworth, James J.: *See—*
Salihi, Jalal T.; and Duckworth, James J., 4,544,873, Cl. 318-801.000.
Duescher, Wayne O., to Twin City Surgical, Inc. Cast cutter apparatus. 4,543,718, Cl. 30-124.000.
Dugge, Richard H., to ACF Industries, Incorporated. Automatic unloading outlet assembly. 4,544,306, Cl. 406-30.000.
Dugger, Ben A., to Columbus Foundries, Inc. Pipe joint glands. 4,544,188, Cl. 285-337.000.
Dumas, Daniel; du Mesnildot, Bruno; and Michel, Christian, to Societe des Electrodes et Refractaires Savoie (SERS). Refractory products formed by grains bound by carbon residues and metal silicon in powder form and process for the production thereof. 4,544,641, Cl. 501-87.000.
du Mesnildot, Bruno: *See—*
Dumas, Daniel; du Mesnildot, Bruno; and Michel, Christian, 4,544,641, Cl. 501-87.000.
Dumoulin, Joseph; and De Berraly, Jean-Marie, to Solvay & Cie S.A. Compositions based on vinylidene fluoride polymers incorporating boron carbide. 4,544,684, Cl. 523-136.000.
Duncan, David J.: *See—*
Cavitt, Michael B.; and Duncan, David J., 4,544,731, Cl. 528-89.000.
Dungs, Horst: *See—*
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,544,451, Cl. 202-114.000.
Dunn, Jimmy L.; Gilstrap, Lonnie D.; Land, Ronny L.; and Romeo, Frank C. Robot grippers. 4,544,193, Cl. 294-86.400.
Dunn, Philip; and King, David A., to Dunn, Philip. Wheelchair with rocking seat and reclining back feature. 4,544,200, Cl. 297-265.000.
Dupeyrat, Benoit: *See—*
Juvin, Didier; and Dupeyrat, Benoit, 4,545,067, Cl. 382-21.000.
Dupin, Thierry; and Voirin, Robert, to Societe Nationale Elf Aquitaine. Catalytic desulfurization process of an acid gas containing H_2S. 4,544,534, Cl. 423-230.000.
Du Pont de Nemours, E. I., and Company: *See—*
Grot, Walther G.; Molnar, Charles J.; and Resnick, Paul R., 4,544,458, Cl. 204-98.000.
Levitt, George, 4,544,401, Cl. 71-92.000.
Levy, Stanley B., 4,544,721, Cl. 526-249.000.
Pick, Rudolph, 4,544,774, Cl. 568-617.000.
Rellick, Joseph R., 4,544,611, Cl. 428-673.000.
Silva, Raimund H.; and Smith, Roger A., 4,544,471, Cl. 204-252.000.
Sogah, Dotsevi Y.; and Webster, Owen W., 4,544,724, Cl. 526-279.000.
Sundet, Sherman A., 4,544,484, Cl. 210-500.200.
Duran, Edward L., to United States of America, Energy. Abrasive slurry composition for machining boron carbide. 4,544,376, Cl. 51-293.000.
Durette, Philippe L., to Merck & Co., Inc. Chiral synthesis of thienamycin from D-glucose. 4,544,502, Cl. 260-349.000.
Durr Industries, Inc.: *See—*
Billings, Bruce J., 4,544,526, Cl. 422-173.000.
Duval Corporation: *See—*
Ochs. Leonard R., 4,544,460, Cl. 204-107.000.
Dziemba, Peter, to MAP Mikrofilm Apparatebau Dr. Poehler GmbH & Co., KG. Transfer device for film card. 4,544,151, Cl. 271-251.000.
E. F. Johnson Company: *See—*
May, Ruth A., 4,544,577, Cl. 427-97.000.
E. H. Wachs Company, The: *See—*
Kwech, Horst; and Olson, Peter K., 4,543,861, Cl. 82-4.00C.
E. J. Brooks Company: *See—*
Swift, Allan W.; and Rivara, Sarah B. S., 4,544,190, Cl. 292-307.00B.
Eastman Kodak Company: *See—*
Painton, Richard C., 4,544,969, Cl. 360-78.000.
Phillips, Bobby M., 4,543,697, Cl. 28-246.000.
Upson, Donald A.; and Steklenski, David J., 4,544,723, Cl. 524-347.000.
West, Bradford D., Jr.; and Berchtold, Jean, 4,544,974, Cl. 360-120.000.
Eaton Corporation: *See—*
Brown, Richard J., 4,544,054, Cl. 192-58.00B.
Butterworth, Edmund M., 4,544,810, Cl. 200-5.00B.
Butterworth, Edmund M.; and Dennison, William G., 4,544,814, Cl. 200-50.00C.
Cranston, Dean H.; and Myers, Charles M., 4,544,293, Cl. 400-320.000.
Ekeleme, Charles E., Jr.; and Martin, Rabian M., 4,543,987, Cl. 137-540.000.
Heilman, Gregory P., 4,543,814, Cl. 73-1.00C.
Reynolds, Joseph D.; and Lauer, Ernst H., 4,543,843, Cl. 74-473.00R.
Eberson, Lennard: *See—*
Oberrauch, Ermanno; and Eberson, Lennard, 4,544,450, Cl. 204-59.00R.
Ebert, Russell L.; and Hayes, Stanley G., to Polaris Industries, Inc. Snowmobile suspension system. 4,544,170, Cl. 280-21.00R.
Echols, John B., to Baker Oil Tools, Inc. Method and apparatus for production of perfect well treatment fluid solutions. 4,544,032, Cl. 166-267.000.
Eckhardt, Erich, to Linde Aktiengesellschaft. Controls for continuously adjustable drive. 4,543,787, Cl. 60-444.000.
Eddinger, Kevin: *See—*
Mosser, Mark F.; and Eddinger, Kevin, 4,544,408, Cl. 106-14.120.
Edgley Aircraft Limited: *See—*
Edgley, John K., 4,544,115, Cl. 244-54.000.
Edgley, John K., to Edgley Aircraft Limited. Ducted propeller aircraft. 4,544,115, Cl. 244-54.000.
Egai, Mikhail N.: *See—*
Fomin, Viktor I.; Guzenko, Stanislav I.; Egai, Mikhail N.; and Manenkov, Jury A., 4,545,042, Cl. 367-189.000.
Egan, James R., to Miller Products, Inc. Laminated member and method of making same. 4,544,590, Cl. 428-40.000.
Egawa, Akira; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Camera with a display device for displaying both object distance informations and coupling range informations. 4,544,254, Cl. 354-403.000.
Egle, Hilda: *See—*
Hartmann, Rolf; Krah, Albrecht; Egle, Hilda; and Ziegler, Rudolf, 4,544,441, Cl. 156-634.000.
Egyt Gyogyszervegyeszeti Gyar: *See—*
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Ehmann, Werner; Homanner, Alfons; and Rinno, Helmut, to Hoechst Aktiengesellschaft. Aqueous polyvinyl ester dispersion, process for its manufacture, and its use. 4,544,689, Cl. 524-52.000.
Ehrhart, Fritz; Chattopadhay, Asoke; and Schmidt, Karl, to Pierburg GmbH & Co. K.G. Fuel supply assembly for mixture-compressing internal combustion engines and associated methods of operation. 4,543,939, Cl. 123-533.000.
Ehring, Carolyn C., to Cairns & Brother Inc. Sleeve attachment for multilayered protective coat. 4,543,670, Cl. 2-85.000.
Eibofner, Eugen; and Strohmaier, Ernst, to Kaltenbach & Voigt GmbH & Co. Arrangement for imposing pressure on maintenance media in medical particularly dental handpieces. 4,544,355, Cl. 433-104.000.
Eisenhardt, Anne R.; and Jensen, Ole J., to Radiometer A/S. Salt bridge liquid. 4,544,455, Cl. 204-1.00T.
EJOT Eberhard Jaeger GmbH & Co. KG: *See—*
Grossberndt, Hermann, 4,544,313, Cl. 411-411.000.
Ekeleme, Charles E., Jr.; and Martin, Rabian M., to Eaton Corporation. Relief valve. 4,543,987, Cl. 137-540.000.
Elabd, Hammam: *See—*
Kosonocky, Walter F.; and Elabd, Hammam, 4,544,939, Cl. 357-30.000.
Eldridge, Graeme W.: *See—*
Clarke, Rowland C.; and Eldridge, Graeme W., 4,544,417, Cl. 148-1.500.
Electralloy Corporation: *See—*
Montgomery, Dale, 4,544,420, Cl. 148-37.000.
Electrovac Fabrikation elektrotechnischer Spezialartikel Gesellschaft m.b.H.: *See—*
Bayer, Helmut, 4,544,831, Cl. 219-449.000.
Eli Lilly and Company: *See—*
Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., 4,544,752, Cl. 548-214.000.
Elkerbout, Marten F.; and Kloosterhof, Leonardus P. A., to U.S. Philips Corporation. Kitchen machine. 4,544,278, Cl. 366-129.000.
Elkhart Machine & Tool Co., Inc.: *See—*
Gorsuch, Ralph E., 4,544,991, Cl. 362-81.000.
Elliott, Donald P.; and Halseth, William L., to C. R. Bard, Inc. Air leak detection system for chest fluid collection bottles and blow-out prevention baffle. 4,544,370, Cl. 604-319.000.
Elliott, Henry H.; Lepovitz, Lawrence R.; and Jones, Dale G., to Emcotek. Method for metal halide removal. 4,544,379, Cl. 55-71.000.
Ellis, Charles B., to Lennox Industries, Inc. Mechanical means for holding air gaps on bolt-down stators in refrigerant compressors. 4,544,334, Cl. 417-360.000.
Elmer, Ben R.: *See—*
Biard, James R.; and Elmer, Ben R., 4,545,076, Cl. 455-612.000.
Elmwood Sensors, Inc.: *See—*
Loring, Dennis J., 4,544,987, Cl. 361-194.000.
Elrick, Edwin, to Elrick, Edwin; Lockhart, David L.; and Hunt, Alfred. Opener structure for a container. 4,544,079, Cl. 220-277.000.
Elsol Product Corp.: *See—*
Wada, Katsuhiko, 4,543,702, Cl. 29-434.000.
Eltech Systems Corporation: *See—*
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., 4,544,457, Cl. 204-67.000.
Ema, Kenji; Saito, Jun; Mitsuishi, Takatoshi; and Ikado, Shuhei, to Wakabayashi Patent Agency. Copolymers of acrylonitrile, styrene, and para-isopropenylphenol. 4,544,727, Cl. 526-313.000.
EMAG Maschinenfabrik GmbH: *See—*
Metz, Rudi; and Scholl, Herbert, 4,544,985, Cl. 361-144.000.
Emcotek: *See—*
Elliott, Henry H.; Lepovitz, Lawrence R.; and Jones, Dale G., 4,544,379, Cl. 55-71.000.
Emerson Electric Co.: *See—*
Vogel, Richard E.; and Bowsky, Benjamin, 4,543,797, Cl. 62-193.000.
Emhart Industries, Inc.: *See—*
Fenton, Frank A., 4,544,397, Cl. 65-332.000.
Emmert, Manfred. Device for the production of pressure. 4,543,877, Cl. 92-90.000.
Endo, Itaru, to Olympus Optical Co., Ltd. Turret. 4,544,236, Cl. 350-247.000.
Endo, Kiyonobu: *See—*
Nose, Noriyuki; and Endo, Kiyonobu, 4,544,269, Cl. 356-222.000.

Endo, Takashi: *See—*
Watanabe, Yoshitaka; and Endo, Takashi, 4,544,931, Cl. 346-140.00R.
Endo, Yukio: *See—*
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.
Energy Conservation Innovations, Inc.: *See—*
Burnett, Lauren W., 4,544,096, Cl. 239-92.000.
Energy Conversion Devices, Inc.: *See—*
Ovshinsky, Stanford R.; and Sapru, Krishna, 4,544,473, Cl. 204-292.000.
Venkatesan, Srinivasan; Pinsky, Naum; and Sapru, Krishna, 4,544,461, Cl. 204-128.000.
Engel, Dusan J.: *See—*
Kurek, Paul R.; Engel, Dusan J.; and Fergin, Richard L., 4,544,796, Cl. 585-856 .00.
Engel, Kurt: *See—*
Scheurecker, Werner; Holzer, Karl; Engel, Kurt; and Schubert, Hermann, 4,544,015, Cl. 164-442.000.
Engel, Walter; and Heinisch, Herbert, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Process for the preparation of compact nitroguanidine. 4,544,769, Cl. 564-242.000.
Engemann, Detlef; Fischer, Dieter; and Vatterott, Karl-Heinz, to Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik. Document scanning apparatus comprising a light conductor block. 4,544,842, Cl. 250-227.000.
Engineering Project Development Limited: *See—*
Mizzi, Pierre M. A., 4,545,023, Cl. 364-709.000.
English, George J.; and Levin, Robert E., to GTE Products Corporation. Sealed lens member for use in a motor vehicle lighting system. 4,545,001, Cl. 362-340.000.
Ennis, Robert M., Jr.; Coffey, D. Michael; and McGhee, R. Wayne, to Cryomagnetics, Inc. Automatic current lead retractor system for superconducting magnets. 4,544,979, Cl. 361-19.000.
Enomoto Industry Co., Ltd.: *See—*
Enomoto, Yukio, 4,544,060, Cl. 198-495.000.
Enomoto, Yukio, to Enomoto Industry Co., Ltd. Chip transporting conveyor. 4,544,060, Cl. 198-495.000.
Enso-Gutzeit Osakeyhtio : *See—*
Lintunen, Tuomo, 4,544,448, Cl. 162-360.100.
Environmental Safety Products, Inc.: *See—*
Trayford, Charles, III; and Petrizzi, Jeffrey M., 4,544,386, Cl. 55-270.000.
Eoff, James M., to United States of America, Energy. Non-bonded piezoelectric ultrasonic transducer. 4,544,859, Cl. 310-335.000.
Epstein, Joseph W.; McKenzie, Thomas C.; and Fanshawe, William J., to American Cyanamid Company. 1-Aryl-3-azabicyclo[3.2.0]heptanes. 4,544,665, Cl. 514-412.000.
Ergenics, Inc.: *See—*
Meyerhoff, Robert W., 4,544,527, Cl. 422-188.000.
Erickson, Paul R.; and Pietila, Kenneth A., to Rexnord Inc. Method and system for recovering coal fines from pipe line coal slurry. 4,544,490, Cl. 210-713.000.
Eriss, Lawrence: *See—*
Stormont, Richard W.; and Eriss, Lawrence, 4,544,528, Cl. 422-246.000.
Ermisch, Dorothee: *See—*
Mallek, Heinz; Laser, Manfred; and Ermisch, Dorothee, 4,544,374, Cl. 48-114.000.
Ernst, Richard J.; and Godsted, Kent B., to Illinois Tool Works Inc. Penetration controlling device and system. 4,543,763, Cl. 52-698.000.
Ersfeld, Dean A.: *See—*
Sandvig, Timothy C.; Ersfeld, Dean A.; and Berg, Eric P., 4,544,572, Cl. 427-44.000.
Esneault, Calvin P.: *See—*
Fuentes, Ricardo, Jr.; and Esneault, Calvin P., 4,544,647, Cl. 502-115.000.
Esselte Pendaflex Corporation: *See—*
Schrotz, Kurt; and Becker, Werner, 4,544,433, Cl. 156-384.000.
Establissements Caillau: *See—*
Calmettes, Lionel, 4,543,691, Cl. 24-20.00R.
Ethicon, Inc.: *See—*
Shalaby, Shalaby W.; and Koelmel, Donald F., 4,543,952, Cl. 128-335.500.
Ethyl Corporation: *See—*
Berry, C. Bernard, 4,544,503, Cl. 260-402.000.
Davidson, Robert I., 4,544,509, Cl. 260-465.00G.
Wolfram, Joachim W., 4,544,505, Cl. 260-413.000.
Etoh, Kuniomi: *See—*
Nanpei, Masaru; Tomita, Akira; Fujimura, Toshiaki; and Etoh, Kuniomi, 4,544,624, Cl. 430-281.000.
Euteneuer, Charles L.: *See—*
Jensen, Gerald A.; and Euteneuer, Charles L., 4,543,771, Cl. 53-520.000.
Euzen, Jean-Paul: *See—*
Dang Vu, Quang; Pradel, Claude; Euzen, Jean-Paul; and Le Page, Jean-Francois, 4,544,544, Cl. 423-659.000.
Evans, Brian, to Pilkington Brothers Limited. Cationic surface coating of flat glass. 4,544,395, Cl. 65-60.300.
Evans, Don S.: *See—*
Kleinberg, Larry K.; and Evans, Don S., 4,543,857, Cl. 76-101.00R.
Evans, Edward R. Tapered and flanged rubber stopper. 4,544,074, Cl. 215-355.000.
Evans, Thomas E.: *See—*
Finch, Charles R.; Wallace, Leslie E.; and Evans, Thomas E., 4,544,706, Cl. 525-146.000.
Ex-Cell-O Corporation: *See—*
Adleman, Larry G.; and Malanaphy, Richard H., 4,543,722, Cl. 30-360.000.
Exxon Research and Engineering Co.: *See—*
Barnett, Don C., 4,544,932, Cl. 346-140.00R.
Fiato, Rocco A.; and Soled, Stuart L., 4,544,672, Cl. 518-700.000.
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., 4,544,674, Cl. 518-717.000.
Seiver, Robert L.; and Chianelli, Russell R., 4,544,481, Cl. 208-215.000.
Siegell, Jeffrey H.; and Coulaloglou, Costas A., 4,543,733, Cl. 34-1.000.
Soled, Stuart L.; and Fiato, Rocco A., 4,544,671, Cl. 518-700.000.
Traficante, Daniel, 4,544,390, Cl. 62-20.000.
Wachs, Israel; and Chersich, Claudio C., 4,544,649, Cl. 502-350.000.
Wortel, Theodorus M., 4,544,539, Cl. 423-328.000.
Faeser, Ulrich; and Mahn, Dieter, to Fresenius AG. Medical peristaltic pump. 4,544,336, Cl. 417-412.000.
Faita, Giuseppe: *See—*
Bianchi, Giuseppe; Mussinelli, Gianluigi; and Faita, Giuseppe, 4,544,464, Cl. 204-147.000.
Falkenstein, Don I.: *See—*
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtinz; and Ching, Dennis T., 4,545,011, Cl. 364-200.000.
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,013, Cl. 364-200.000.
Fanshawe, William J.: *See—*
Epstein, Joseph W.; McKenzie, Thomas C.; and Fanshawe, William J., 4,544,665, Cl. 514-412.000.
Fanslau, Christine: *See—*
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,544,650, Cl. 502-424.000.
Fansteel Inc.: *See—*
Schiele, Edward K.; Manley, Robert V., Jr.; and Rerat, Carlos F., 4,544,403, Cl. 75-0.5AB.
Fanuc Ltd.: *See—*
Komiya, Hidetsugu; and Hattori, Seiichi, 4,544,971, Cl. 360-96.500.
Nomura, Yoshiyuki; Okuda, Kanemasa; and Ishii, Hisao, 4,544,819, Cl. 219-69.00W.
Farmos Group, Ltd.: *See—*
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,544,664, Cl. 514-396.000.
Farnum, Eugene H.; and Fries, R. Jay, to United States of America, Energy. Laser target fabrication, structure and method for its fabrication. 4,544,520, Cl. 376-152.000.
Farr, Glyn P. R., to Lucas Industries Public Limited Company. Control valves for vehicle hydraulic systems. 4,543,976, Cl. 137-101.000.
Farrelly, Robert E., to Jack Farrelly Company, The. Catch basin grate riser. 4,544,302, Cl. 404-2.000.
Faulkner, John R.: *See—*
Clements, Jack W.; and Faulkner, John R., 4,545,018, Cl. 364-474.000.
Faust, Robert J., to Calgon Corporation. Process for determining the amount of organic phosphonate present in an aqueous solution. 4,544,639, Cl. 436-104.000.
Fearnot, Neal E.: *See—*
Cook, William A.; Fearnot, Neal E.; and Geddes, Leslie A., 4,543,954, Cl. 128-419.0PG.
Fedele, Nicola J.: *See—*
Altman, Ted N.; and Fedele, Nicola J., 4,544,911, Cl. 340-347.0DA.
Federman, Manfred: *See—*
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.
Fedi, Mauro; and Bonacchi, Graziano, to Malesci S.p.A. Istituto Farmacologico. Xanthine derivatives, pharmaceutical compositions containing same and their therapeutic use. 4,544,556, Cl. 514-263.000.
Feezor, Michael D.: *See—*
Sorrell, Furman Y.; Curtin, Thomas B.; and Feezor, Michael D., 4,543,822, Cl. 73-170.00A.
Fehrenkamp, William; and Jameson, Joe P., to AMF Incorporated. Telemetry system cable. 4,545,040, Cl. 367-76.000.
Felder, Christian, to Gebhardt Fordertechnik GmbH. Distribution installation for moving piece goods. 4,544,064, Cl. 209-583.000.
Felt Products Mfg. Co.: *See—*
Cobb, David A.; and Miszczak, Frank L., 4,544,169, Cl. 277-235.00B.
Fenner America Inc.: *See—*
Soussloff, Dimitri G., 4,543,704, Cl. 29-458.000.
Fenton, Frank A., to Emhart Industries, Inc. Feeder mechanism for supplying gobs of plastic material. 4,544,397, Cl. 65-332.000.
Fergin, Richard L.: *See—*
Kurek, Paul R.; Engel, Dusan J.; and Fergin, Richard L., 4,544,796, Cl. 585-856.000.
Ferguson, Walter J., to Dresser Industries, Inc. Pressure gauge with add-on wrench flats. 4,543,833, Cl. 73-741.000.
Ferix Corporation: *See—*
Springer, Gilbert D., 4,544,421, Cl. 148-103.000.
Ferrari, Leonard A., to University of California, The Regents of the. Ultrasonic acoustic imaging apparatus. 4,543,826, Cl. 73-602.000.

Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board game utilizing articulated playing pieces. 4,544,162, Cl. 273-242.000.

Fesenko, Evgeny P.: *See—*
Sominin, Mikhail A.; Surikov, Valery N.; Belokopytov, Jury A.; and Fesenko, Evgeny P., 4,545,008, Cl. 364-148.000.

Fesman, Gerald, to Stauffer Chemical Company. Filled or extended polyurethane foam containing polyethylene glycol softening agent. 4,544,678, Cl. 521-107.000.

Fiat Auto S.p.A.: *See—*
Di Nunzio, Vittorio, 4,544,909, Cl. 340-52.00R.

Fiat Ferroviaria Savigliano S.p.A.: *See—*
Racca, Carlo, 4,543,746, Cl. 49-118.000.

Fiato, Rocco A.; and Soled, Stuart L., to Exxon Research and Engineering Co. Cobalt-promoted catalysts for use in Fischer-Tropsch slurry process. 4,544,672, Cl. 518-700.000.

Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., to Exxon Research and Engineering Co. Cobalt-promoted fischer-tropsch catalysts. 4,544,674, Cl. 518-717.000.

Fiato, Rocco A.: *See—*
Soled, Stuart L.; and Fiato, Rocco A., 4,544,671, Cl. 518-700.000.

Fiedelak, Rudolf A.: *See—*
Younger, Steven K.; and Fiedelak, Rudolf A., 4,544,203, Cl. 297-391.000.

Fields, Richard P.: *See—*
Bunker, James E.; and Fields, Richard P., 4,544,467, Cl. 204-159.240.

Figge, Dieter; Siemer, Hans; Artz, Gerd; and Philipp, Clemens, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Feeding device for introducing molten steel into twin-belt casters and mode of operation of such a feed device. 4,544,018, Cl. 164-481.000.

Figgie International, Inc.: *See—*
Young, Jorge A.; and Khandwala, Bhupendra J., 4,544,832, Cl. 235-377.000.

Finch, Charles R.; Wallace, Leslie E.; and Evans, Thomas E., to Dow Chemical Company, The. Highly impact resistant carbonate polymer blends. 4,544,706, Cl. 525-146.000.

Fingermatrix, Inc.: *See—*
Schiller, Michael, 4,544,267, Cl. 356-71.000.

Finike Italiana Marposs S.p.A.: *See—*
Golinelli, Guido; and Possati, Mario, 4,543,725, Cl. 33-178.00E.

Fink, David J.: *See—*
Hughes, Kenneth E.; Hutson, Timothy B.; and Fink, David J., 4,544,516, Cl. 264-108.000.

Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., to General Motors Corporation. Latch release arrangement. 4,544,189, Cl. 292-50.000.

Firestone Tire & Rubber Company, The: *See—*
Graves, Daniel F.; and Snyder, Dennis L., 4,544,537, Cl. 423-300.000.
Hausch, Walter R., 4,544,427, Cl. 156-97.000.

Fischer, Dieter: *See—*
Engemann, Detlef; Fischer, Dieter; and Vatterott, Karl-Heinz, 4,544,842, Cl. 250-227.000.

Fisher, Edwin N., to Atlantic Richfield Company. Ice aggregate road and method and apparatus for constructing same. 4,544,304, Cl. 404-17.000.

Fisher, Edwin P.: *See—*
Salas, Edward R.; Fisher, Edwin P.; Johnson, Robert B.; Nibby, Chester M., Jr.; and Boudreau, Daniel A., 4,545,010, Cl. 364-200.000.

Fitter, Johan C.; and Henderson, David J., to Fitter, Johan Christiaan. Filler unit for topping up a container with liquid. 4,544,004, Cl. 141-31.000.

Fitter, Johan Christiaan: *See—*
Fitter, Johan C.; and Henderson, David J., 4,544,004, Cl. 141-31.000.

Fitzmaurice, Ian P., to Lucas Industries. Gas turbine engine fuel control systems. 4,543,782, Cl. 60-39.281.

Fitzpatrick, J. Michael: *See—*
Smolanoff, Joel R.; Fitzpatrick, J. Michael; and Ollinger, Janet, 4,544,553, Cl. 514-92.000.

Fletcher, Jeffery N.: *See—*
Horn, Darrell C.; and Fletcher, Jeffery N., 4,543,775, Cl. 56-235.000.

Flora, Laurence P., to Burroughs Corporation. Apparatus for testing an integrated circuit chip without concern as to which of the chip's terminals are inputs or outputs. 4,544,882, Cl. 324-73.00R.

Flynn, Charles J.: *See—*
Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., 4,544,218, Cl. 339-31.00L.

FMC Corporation: *See—*
Downey, Gale D.; and Jones, Charles E., 4,544,494, Cl. 252-135.000.
Lee, Nathan D.; and Sethi, Dalbir S., 4,544,543, Cl. 423-588.000.
Poock, Darwin N., 4,544,071, Cl. 212-264.000.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Lock for safety belts. 4,543,694, Cl. 24-656.000.

Fohler, Johann, to Voest-Alpine Aktiengesellschaft. Arrangement for exchanging measuring and/or sampling probes. 4,543,838, Cl. 73-864.310.

Foister, Robert T.; and Gray, Richard K., to General Motors Corporation. Method of bonding phosphated steel surfaces electrodeposited with a primer. 4,544,432, Cl. 156-307.300.

Foley, Paul, to Celanese Corporation. Production of carbonate diesters from oxalate diesters. 4,544,507, Cl. 260-463.000.

Folling, Norman D.; and Terrana, Donald B., to Boeing Company, The. Cargo transfer system. 4,544,319, Cl. 414-505.000.

Fomin, Viktor I.; Guzenko, Stanislav I.; Egai, Mikhail N.; and Manenkov, Jury A. Method for generation of acoustic vibrations and source of acoustic vibrations for realizing same. 4,545,042, Cl. 367-189.000.

Force, Carlton G.: *See—*
Alford, John A.; Force, Carlton G.; and Gowan, John W., Jr., 4,544,726, Cl. 526-309.000.

Ford Motor Company: *See—*
Bostock, Philip G.; and Holland, Graham J., 4,543,924, Cl. 123-195.00A.
Hetrick, Robert E., 4,544,470, Cl. 204-248.000.
Kearney, Dolores C.; Giza, Peter; and Matz, Bruno, 4,544,013, Cl. 164-5.000.
Ma, Thomas T., 4,543,918, Cl. 123-52.0MB.
Rao, Vemulapalli D. N.; and Wade, Wallace R., 4,544,388, Cl. 55-282.000.
Sabel, Gustav, 4,543,845, Cl. 74-477.000.

Ford-Werke Aktiengesellschaft: *See—*
Svab, Eugen; van Deursen, Petrus H.; and Cadee, Theodorus P. M., 4,543,852, Cl. 74-695.000.

Forde, John C.: *See—*
Boothman, David R.; and Forde, John C., 4,544,982, Cl. 361-96.000.

Forenade Fabriksverken: *See—*
Akhagen, Rune; and Jansson, Arthur, 4,543,885, Cl. 102-373.000.

Forsythe, Curtis J., to Top-Scor Products, Inc. Stearoyl lactylate salt composition having improved physical properties and method of production. 4,544,569, Cl. 426-653.000.

Fournet, Gaston: *See—*
Heyland, Sven; Fournet, Gaston; and Bosch, Hans, 4,544,568, Cl. 426-650.000.

Fowler, David P., to Frito-Lay, Inc. Apparatus for seasoning snack food items. 4,543,907, Cl. 118-19.000.

Fraefel, Wolfgang; and Tschannen, Roland, to Solco Basel AG. Process for the preparation of cell and tissue regenerating substances. 4,544,552, Cl. 514-23.000.

Fraley, Lawrence R.; and Westlund, Arnold E., Jr., to GTE Products Corporation. Projection lamp unit. 4,545,000, Cl. 362-304.000.

Framatome & Cie.: *See—*
Millot, Jean-Paul; Desfontaines, Guy; and Babin, Michel, 4,544,521, Cl. 376-209.000.

Franke, Albrecht: *See—*
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.

Franklin, Marilyn L. Disposable torso covers. 4,543,668, Cl. 2-48.000.

Franz, Klaus-Dieter; Kieser, Manfred; and Stahlecker, Otto, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Weathering-resistant pearlescent pigments. 4,544,415, Cl. 106-288.00R.

Fraser, Teresa M., to Dresser Industries, Inc. Refractory fused chrome-alumina bricks and compositions made from a granular fused material and processes for their production. 4,544,643, Cl. 501-127.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Engel, Walter; and Heinisch, Herbert, 4,544,769, Cl. 564-242.000.

Frazer, John M., to Taylor Freezer Company. Pump type dispenser for heat softenable food products. 4,544,085, Cl. 222-146.400.

Freeburg, Thomas A., to Motorola, Inc. Portable radio for a zoned data communications system communicating message signals between portable radios and a host computer. 4,545,071, Cl. 455-33.000.

Freeman, Gerard L.: *See—*
Branovich, Louis E.; Smith, Bernard; and Freeman, Gerard L., 4,544,535, Cl. 423-290.000.

Freese, Uwe E.: *See—*
Goepp, Robert A.; and Freese, Uwe E., 4,543,949, Cl. 128-127.000.

French, Michael P., to RCA Corporation. On-off arrangement in a microprocessor controlled remote transmitter for a consumer instrument. 4,544,924, Cl. 340-825.690.

Fresenius AG: *See—*
Faeser, Ulrich; and Mahn, Dieter, 4,544,336, Cl. 417-412.000.

Freund Precision, Inc.: *See—*
Freund, Robert F.; and Valentine, Daniel R., 4,544,184, Cl. 283-94.000.

Freund, Robert F.; and Valentine, Daniel R., to Freund Precision, Inc. Tamper-proof identification card and identification system. 4,544,184, Cl. 283-94.000.

Frey, Karl: *See—*
Maurer, Albrecht; and Frey, Karl, 4,543,868, Cl. 83-713.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Figge, Dieter; Siemer, Hans; Artz, Gerd; and Philipp, Clemens, 4,544,018, Cl. 164-481.000.

Friedewald, Gunter, to Siepmann-Werke GmbH & Co. KG. Tire and antiskid net for vehicle tires. 4,544,010, Cl. 152-231.000.

Friedman, Ernest H.; Sanders, Gary G.; and Hunter, Steven L., to Friedman, Ernest H. Human response apparatus and method. 4,543,957, Cl. 128-630.000.

Friedrich, Wolfgang: *See—*
Hans, Rudiger; and Friedrich, Wolfgang, 4,544,168, Cl. 277-84.000.

Fries, R. Jay: *See—*
Farnum, Eugene H.; and Fries, R. Jay, 4,544,520, Cl. 376-152.000.

Frito-Lay, Inc.: *See—*
Fowler, David P., 4,543,907, Cl. 118-19.000.

Fritsch, Joseph E. Self-contained slip ring assembly. 4,544,215, Cl. 339-5.00M.

Fritz, William E., to Dev-Mark, Inc. Hatch cover seal assembly. 4,543,889, Cl. 105-377.000.
Fritzsche nee Lukacs, Ildiko : *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Froelich, Leo. Apparatus for refinishing a pelletizing die. 4,543,750, Cl. 51-50.00R.
Fry, John S.: *See*—
Salensky, George A.; and Fry, John S., 4,544,688, Cl. 523-458.000.
Fuchs, Franz, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Electromagnetic double-valve for controlling the flow of two different materials. 4,543,991, Cl. 137-595.000.
Fuchs, Rainer; and Naumann, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of certain enantiomeric pairs of α-cyano-3-phenoxy-4-fluoro-benzyl permethrate. 4,544,508, Cl. 260-465.00D.
Fuentes, Ricardo, Jr.; and Esneault, Calvin P., to Dow Chemical Company, The. Catalyst prepared from organomagnesium compound, organic hydroxyl-containing compound, reducing halide source and transition metal compound. 4,544,647, Cl. 502-115.000.
Fugazza, Ermanno; and Dal Poz, Giuseppe, to A.M.S.E.A.-Azienda Meccanica. Starter for internal combustion engines. 4,543,922, Cl. 123-179.00S.
Fuji Electric Company, Ltd.: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,545,070, Cl. 382-48.000.
Fuji Photo Film Co., Ltd.: *See*—
Kanaoka, Takeshi; and Shimizu, Shigehisa, 4,544,259, Cl. 355-1.000.
Konishi, Masahiro, 4,544,960, Cl. 360-35.100.
Maemori, Takashi; and Kamata, Kazuo, 4,544,249, Cl. 354-195.120.
Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, 4,544,628, Cl. 430-572.000.
Ohtsuka, Shuichi, 4,544,261, Cl. 355-3.0CH.
Oishi, Kengo; and Moriwaki, Masayoshi, 4,544,975, Cl. 360-130.330.
Oishi, Kengo; Komiyama, Choji; and Suzuki, Osamu, 4,544,976, Cl. 360-132.000.
Takahashi, Yonosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,544,627, Cl. 430-325.000.
Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,544,601, Cl. 428-330.000.
Fuji Xerox Co., Ltd.: *See*—
Itami, Teruhiko; Kimoto, Toshifumi; Yamasawa, Akira; and Saitoh, Koichi, 4,544,574, Cl. 427-48.000.
Yokoi, Naoki, 4,544,936, Cl. 346-209.000.
Fujibayashi, Kazuo: *See*—
Momiyama, Kikuo; and Fujibayashi, Kazuo, 4,544,256, Cl. 354-429.000.
Fujihara, Naoto: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,545,070, Cl. 382-48.000.
Fujikawa, Keishin: *See*—
Nagatomo, Hiroto; Maejima, Hisashi; Suzuki, Jun; and Fujikawa, Keishin, 4,544,318, Cl. 414-222.000.
Fujikawa, Takashi: *See*—
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, 4,544,414, Cl. 106-287.240.
Fujimura, Toshiaki: *See*—
Nanpei, Masaru; Tomita, Akira; Fujimura, Toshiaki; and Etoh, Kuniomi, 4,544,624, Cl. 430-281.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,544,653, Cl. 514-202.000.
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,544,751, Cl. 548-127.000.
Fujisawa, Takao, to Nittan Company, Limited. Fire alarm system. 4,544,921, Cl. 340-584.000.
Fujise, Masayuki: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,544,233, Cl. 350-96.200.
Fujishima, Susumu: *See*—
Wada, Takeshi; Kita, Hisanao; Wada, Tatsuji; Fujishima, Susumu; and Kadowaki, Hironori, 4,543,711, Cl. 29-726.000.
Fujitsu Limited: *See*—
Iwamoto, Hiromu; and Tamada, Haruo, 4,544,912, Cl. 340-347.0AD.
Nakano, Tomio; Nakano, Masao; and Ogawa, Junji, 4,545,037, Cl. 365-205.000.
Fujiwara, Hideo: *See*—
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.
Fujiyama, Masaaki: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,544,601, Cl. 428-330.000.
Fujizoki Pharmaceutical Co., Ltd.: *See*—
Soma, Kazunori; and Kasahara, Yasushi, 4,544,640, Cl. 436-506.000.
Fujoika, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Ether carbinols, process for preparing same, products produced according to said processes containing said ether carbinols, organoleptic uses thereof, ether carboxaldehydes and organoleptic uses thereof. 4,544,775, Cl. 568-675.000.
Fukunaga, Masao; and Nonoguchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Hair styling appliance. 4,543,968, Cl. 132-33.00R.
Funada, Etuo: *See*—
Osawa, Michitaka; Funada, Etuo; Miyajima, Hiroyuki; Maekawa, Hitoshi; and Ando, Kunio, 4,544,896, Cl. 330-284.000.
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Process for removing metal surface oxide. 4,544,462, Cl. 204-129.000.
Gabel, Robert A.: *See*—
Kurth, Richard R.; and Gabel, Robert A., 4,544,927, Cl. 343-373.000.
Gagnebin, Gaston: *See*—
Geiger, Michel; Gagnebin, Gaston; and Ackermann, Jacques, 4,544,284, Cl. 368-294.000.
Gagnon, Ralph J., to Hughes Aircraft Company. High efficiency optical tank for two-color liquid crystal light valve image projection with color selective prepolarization. 4,544,237, Cl. 350-331.00R.
Gajewski, Robert P.: *See*—
Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., 4,544,752, Cl. 548-214.000.
Galasso, Francis S.: *See*—
Veltri, Richard D.; and Galasso, Francis S., 4,544,412, Cl. 106-286.500.
Galvin, Aaron A.; Harvey, Roy L.; and Leff, Kenneth J., to American District Telegraph Company. Optically-based access control system. 4,544,836, Cl. 235-487.000.
Ganesan, Apparajan: *See*—
Beale, Richard G.; and Ganesan, Apparajan, 4,544,878, Cl. 323-315.000.
Gann, Ting: *See*—
Ying-Ming, Tsai; Hsiao-Ming, Chen; and Gann, Ting, 4,544,530, Cl. 423-10.000.
Gannon, Charles R.: *See*—
Wombles, Robert H.; Carlos, Donald D.; and Gannon, Charles R., 4,544,411, Cl. 106-279.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Maurer, Thomas; Gauch, Wolfgang; and Devrient, Ludwig, 4,544,181, Cl. 283-74.000.
Garbutt, Valerie. Sun visor. 4,543,667, Cl. 2-13.000.
Gardella, John M.; Ciepierski, Casimir; Alfano, Michael; and Chang, Tiang-Shing, to Block Drug Company Inc. Reciprocating dental prophylactic angular device. 4,544,356, Cl. 433-122.000.
Gardner, Robert F.; and Rohn, Bruce D., to General Motors Corporation. Sequential fuel injection sync pulse generator. 4,543,936, Cl. 123-475.000.
Gartside, Robert J.; and Woebcke, Herman N., to Stone & Webster Engineering Corporation. Low residence time solid-gas separation process. 4,544,480, Cl. 208-127.000.
Gas Research Institute: *See*—
Krill, Wayne V.; Wong, Thomas; and Gotterba, James, 4,543,940, Cl. 126-92.0AC.
Gascuel, Jean-Paul; and Rivaillier, Jacques. Method and device for reading matrix printing text. 4,545,066, Cl. 382-11.000.
Gastaud, Jean M. 3,20-Diketo, 6-methyl, 17-alpha-hydroxy 19-norpregna 4,6-diene, its esters and the uses thereof. 4,544,555, Cl. 260-397.400.
Gauch, Wolfgang: *See*—
Maurer, Thomas; Gauch, Wolfgang; and Devrient, Ludwig, 4,544,181, Cl. 283-74.000.
Gavrin, Edward S.: *See*—
Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., 4,545,012, Cl. 364-200.000.
Gebhardt Fordertechnik GmbH: *See*—
Felder, Christian, 4,544,064, Cl. 209-583.000.
Geddes, Leslie A.: *See*—
Cook, William A.; Fearnot, Neal E.; and Geddes, Leslie A., 4,543,954, Cl. 128-419.0PG.
Geibel, Jon F.; Cliffton, Michael D.; and Murtha, Timothy P., to Phillips Petroleum Company. Preparation of poly(arylene sulfide) from halothiophenol and alkaline metal hydroxide. 4,544,735, Cl. 528-374.000.
Geiger, Michel; Gagnebin, Gaston; and Ackermann, Jacques, to Omega SA. Leakproof watch case. 4,544,284, Cl. 368-294.000.
Gelbard, Robert B.: *See*—
Horvay, Julius B.; and Gelbard, Robert B., 4,543,799, Cl. 62-283.000.
General Can Company, Inc.: *See*—
Wright, Philip M.; and Didier, Donald, 4,544,080, Cl. 220-359.000.
General Electric Company: *See*—
Afifi, Mostafa S.; and Chiappetta, Frank R., 4,544,928, Cl. 343-781.00P.
Allen, Richard B.; and Avakian, Roger W., 4,544,677, Cl. 521-91.000.
Boothman, David R.; and Forde, John C., 4,544,982, Cl. 361-96.000.
Curulla, Michael V.; Price, John F.; Matzner, Bruce; Brayman, Kenneth W.; and Qurnell, Frank D., 4,544,522, Cl. 376-441.000.
Haaf, William R., 4,544,703, Cl. 525-92.000.
Hoffman, David L., 4,544,048, Cl. 188-251.00A.
Horyay, Julius B.; and Gelbard, Robert B., 4,543,799, Cl. 62-283.000.
King, James L., 4,544,856, Cl. 310-71.000.
McCready, Russell J., 4,544,734, Cl. 528-288.000.
Molari, Richard E., Jr., 4,544,586, Cl. 428-29.000.

Ohno, John M., 4,544,517, Cl. 264-113.000.
Shanks, Bruce E., 4,544,998, Cl. 362-267.000.
Swank, Harry R.; Doggett, Fred F.; Huyler, Lee E.; and Sofia, Santo J., 4,544,955, Cl. 358-246.000.
Walker, Loren H., 4,545,002, Cl. 363-37.000.

General Foods Corporation: *See*—
Barnett, Ronald E., 4,544,565, Cl. 426-538.000.
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., 4,544,566, Cl. 426-548.000.
Gottesman, Martin, 4,544,567, Cl. 426-594.000.

General Instrument Corp.: *See*—
Naiff, Kenneth L., 4,545,033, Cl. 365-51.000.

General Motors Corporation: *See*—
Angle, Christopher P.; and Parker, Barry R., 4,544,192, Cl. 292-341.180.
Beauch, Howard D., 4,543,848, Cl. 74-493.000.
Bonvallet, Duane J., 4,543,920, Cl. 123-90.430.
Buchanan, Harry C., Jr.; Mack, William R.; and Malhotra, Jagmohan K., 4,543,839, Cl. 74-98.000.
Buttry, Robert C.; and Boyer, James A., 4,544,812, Cl. 200-19.0DC.
Chang, Shih-Chia, 4,544,444, Cl. 156-643.000.
Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., 4,544,189, Cl. 292-50.000.
Foister, Robert T.; and Gray, Richard K., 4,544,432, Cl. 156-307.300.
Gardner, Robert F.; and Rohn, Bruce D., 4,543,936, Cl. 123-475.000.
Kade, Alexander; and Radomski, Thomas A., 4,545,004, Cl. 363-63.000.
Melchert, Walter K., 4,544,126, Cl. 249-83.000.
Murty, V. Balarama, 4,544,868, Cl. 318-254.000.
Nagy, Louis L.; and O'Rourke, Michael J., 4,543,823, Cl. 73-304.00C.
Nagy, Louis L.; and O'Rourke, Michael J., 4,544,880, Cl. 324-58.50R.
Rao, Bangaru V. N., 4,544,422, Cl. 148-142.000.
Shellhause, Ronald L., 4,544,049, Cl. 188-364.000.
Weaver, John R., II; and McClure, Nathaniel D., 4,544,940, Cl. 357-35.000.

General Telephone of Michigan: *See*—
Stuparits, Jeffrey J.; and Cramer, Russell L., 4,544,809, Cl. 179-175.20R.

GEO Vann, Inc.: *See*—
George, Flint R., 4,544,034, Cl. 166-297.000.

Geonics Limited: *See*—
Kaufman, Alexander A.; and McNeill, James D., 4,544,892, Cl. 324-334.000.

George, Benjamin B., to Tivoli Industries, Inc. Underwater lighting system with grounded return line. 4,544,996, Cl. 362-238.000.

George Fischer Aktiengesellschaft: *See*—
Linkert, Reinhold; Becker, Emil; and Hoffmann, Horst, 4,544,407, Cl. 75-130.00A.

George, Flint R., to GEO Vann, Inc. Actuation of a gun firing head. 4,544,034, Cl. 166-297.000.

Gerdes, Jerry D.: *See*—
Healy, Mark; and Gerdes, Jerry D., 4,543,985, Cl. 137-505.250.

Gergoe, Bela: *See*—
Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., 4,544,189, Cl. 292-50.000.

Gerson, Ira A., to Motorola, Inc. Method and means of determining coefficients for linear predictive coding. 4,544,919, Cl. 340-347.000.

Gessman, Lawrence J. Method and apparatus for differentiating antegrade from retrograde P-waves and for preventing pacemaker generated tachycardia. 4,543,963, Cl. 128-702.000.

Gestetner, David G. Holding element for sheets of paper and similar materials. 4,544,298, Cl. 402-19.000.

Getson, John C.: *See*—
Streusand, Marie J.; Getson, John C.; and McAfee, Richard C., 4,544,696, Cl. 524-428.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Weirich, Walter; and Peters, Bernd, 4,544,185, Cl. 285-137.00R.

Giachetti, Ettoro: *See*—
Mayr, Adolfe; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettoro, 4,544,717, Cl. 526-125.000.

Gibbons, James F. Process for high temperature surface reactions in semiconductor material. 4,544,418, Cl. 148-1.500.

Gibson, William K., to R.W. Packaging, Ltd. Label printing device. 4,544,437, Cl. 156-584.000.

Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., to Nalco Chemical Company. Water-soluble polymers containing 2-acrylamido-2-methylpropane-sulfonic acid, sodium salt (AMPS)-acrylamide-N,N-diallylacetamide. 4,544,719, Cl. 526-240.000.

Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., to Nalco Chemical Company. Water-soluble terpolymers of 2-acrylamido-2-methylpropane-sulfonic acid, sodium salt (AMPS), n-vinylpyrrolidone and acrylonitrile. 4,544,722, Cl. 526-264.000.

Gil, Angel; and Valverde, Luis, to Union Industrial y Agroganadera, S.A. (UNIASA). Nucleotide enriched humanized milk and process for its preparation. 4,544,559, Cl. 426-72.000.

Gilbert, Richard L., to ACF Industries, Incorporated. Torque application assembly for closure valve of a railroad hopper car outlet. 4,543,851, Cl. 74-531.000.

Gill, Michael; and Rogers, Mark C., to Advanced Solar Systems. Nontracking parabolic solar energy collector apparatus. 4,543,946, Cl. 126-438.000.

Gillett, John B., to International Business Machines Corporation. Actuator for zero insertion force connectors. 4,544,223, Cl. 339-75.0MP.

Gillham, Gordon D.: *See*—
Wier, Donald R.; and Gillham, Gordon D., 4,544,206, Cl. 299-4.000.

Gilstrap, Lonnie D.: *See*—
Dunn, Jimmy L.; Gilstrap, Lonnie D.; Land, Ronny L.; and Romeo, Frank C., 4,544,193, Cl. 294-86.400.

Giorno, Vincent L. Induced controlled detonation internal combustion engine. 4,543,916, Cl. 123-48.00A.

Giroux, Claude, to Texas Turbine, Inc. Face seal with resilient packing ring forcing face rings together. 4,544,167, Cl. 277-82.000.

Girsch, Charles W.: *See*—
Moriarity, Aaron J.; and Girsch, Charles W., 4,543,740, Cl. 40-315.000.

Girsch Design Associates: *See*—
Moriarity, Aaron J.; and Girsch, Charles W., 4,543,740, Cl. 40-315.000.

Giuli, Dino, to Selenia, Industrie Elettroniche Associate, S.p.A. Adaptive jamming-signal canceler for radar receiver. 4,544,926, Cl. 343-18.00E.

Givaudan Corporation: *See*—
Ochsner, Paul A., 4,544,714, Cl. 252-522.00R.

Giza, Peter: *See*—
Kearney, Dolores C.; Giza, Peter; and Matz, Bruno, 4,544,013, Cl. 164-5.000.

Glaser, Thomas W.: *See*—
Anderson, Todd B.; Glaser, Thomas W.; and Neesz, John J., 4,544,968, Cl. 360-78.000.

Glasmeyer, Ulrich; and Willaschek, Horst, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of producing steels of great purity and low gas content in steel mills and steel foundries and apparatus therefor. 4,544,405, Cl. 75-51.200.

Glasmire, Samuel G. Protective traffic barrier. 4,544,303, Cl. 404-6.000.

Glatt Maschinen- Und Apparatebau AG: *See*—
Glatt, Werner; and Grab, Erwin, 4,543,906, Cl. 178-1.700.

Glatt, Werner; and Grab, Erwin, to Glatt Maschinen- Und Apparatebau AG. Device for coating particles, particularly drugs in the form of particles, such as tablets. 4,543,906, Cl. 178-1.700.

Glattli, Hans-Heinrich: *See*—
Stoll, Kurt; and Glattli, Hans-Heinrich, 4,544,130, Cl. 251-208.000.

Glover, John H., to Sundstrand Corporation. Aircraft in-flight center of gravity measuring system. 4,545,019, Cl. 364-463.000.

Gnadig, Gerhard; and Kuklinski, Siegfried, to Werner & Pfleiderer. Workpiece having wear-resistant inserts locked in recesses in the workpiece. 4,544,341, Cl. 425-192.00R.

Godsted, Kent B.: *See*—
Ernst, Richard J.; and Godsted, Kent B., 4,543,763, Cl. 52-698.000.

Goepp, Robert A.; and Freese, Uwe E., to University Patents, Inc. Custom valved cervical cap. 4,543,949, Cl. 128-127.000.

Gokorsch, Wilfried: *See*—
Walter, Kurt; Gokorsch, Wilfried; Kurth, Gunter; Grusdt, Rainer; and Schreiter, Manfred, 4,543,770, Cl. 53-511.000.

Goldberg, Gerhard; and Lange, Alois, to Taprogge Gesellschaft mbH. Sluice for collecting cleaning bodies. 4,544,027, Cl. 165-95.000.

Goldman, David A., to Designs for Vision, Inc. Automatic facusing using slope and peak detection. 4,544,953, Cl. 358-227.000.

Goldman, Scott M. Device for cleaning stays. 4,543,683, Cl. 15-256.600.

Golinelli, Guido; and Possati, Mario, to Finike Italiana Marposs S.p.A. Ring gauge for checking external dimensions. 4,543,725, Cl. 33-178.00E.

Gommel, Karl: *See*—
Grunikiewicz, Peter; Gommel, Karl; and Junginger, Klaus M., 4,543,720, Cl. 30-272.00R.

Goodman, David S.; Selvin, Gerald J.; Naus, Hubert W.; Rofer, David; and McNutt, Randy A., to International Telephone & Telegraph Corp. Self-locking electrical connector. 4,544,224, Cl. 339-89.00M.

Goodman, Joseph. Book reference list. 4,544,360, Cl. 434-178.000.

Goodyear Tire & Rubber Company, The: *See*—
Anderson, Edward, Jr., 4,544,675, Cl. 521-43.000.
Parker, Dane K., 4,544,710, Cl. 525-332.200.
Richards, Jimmy L., 4,544,603, Cl. 428-371.000.

Gores, Carolyn C.: *See*—
Gores, Kenneth W.; and Gores, Carolyn C., 4,544,354, Cl. 433-42.000.

Gores, Kenneth W.; and Gores, Carolyn C. Anteriorly bridged dental trays. 4,544,354, Cl. 433-42.000.

Gorsuch, Ralph E., to Elkhart Machine & Tool Co., Inc. Lighted running board. 4,544,991, Cl. 362-81.000.

Gosciniak, Guy: *See*—
Moessinger, Albert; Gosciniak, Guy; and Angebault, Joel, 4,544,001, Cl. 139-443.000.

Goto, Kunio: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.

Gotou, Takeo: *See*—
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, 4,543,923, Cl. 123-179.00F.

Gotterba, James: *See*—
Krill, Wayne V.; Wong, Thomas; and Gotterba, James, 4,543,940, Cl. 126-92.0AC.

Gottesman, Martin, to General Foods Corporation. Simultaneous coffee hydrolysis and oil extraction. 4,544,567, Cl. 426-594.000.

Gould Inc.: *See—*
Minten, Karl; and Krug, William, 4,544,707, Cl. 525-330.400.
Govan, Donald T. Line cutter for outboard and inboard/outboard motors. 4,544,363, Cl. 440-73.000.
Gowan, John W., Jr.: *See—*
Alford, John A.; Force, Carlton G.; and Gowan, John W., Jr., 4,544,726, Cl. 526-309.000.
Grab, Erwin: *See—*
Glatt, Werner; and Grab, Erwin, 4,543,906, Cl. 178-1.700.
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., to Diebold, Incorporated. Multi-picker mechanism for automatic banking machines. 4,544,149, Cl. 271-107.000.
Graham, Kenneth J.; and Sewell, Robert G. S. Blast attenuator. 4,543,872, Cl. 86-1.00B.
Graham, Richard W., II: *See—*
Shapiro, Wilbur; Graham, Richard W., II; and Anderson, Hugh G., Jr., 4,544,285, Cl. 384-99.000.
Graham, Samuel L.: *See—*
Shepard, Kenneth L.; and Graham, Samuel L., 4,544,667, Cl. 514-470.000.
Grammatica, Steven J.: *See—*
Mort, Joseph; Jansen, Frank; Grammatica, Steven J.; and Morgan, Michael A., 4,544,617, Cl. 430-58.000.
Grammer, Willibald: *See—*
Meiller, Hermann; and Storch, Helmut, 4,544,598, Cl. 428-246.000.
Grandvallet, Gilles: *See—*
Deborde, Albert H.; and Grandvallet, Gilles, 4,543,999, Cl. 139-1.00C.
Grant, John T., to Pittway Corporation. Electrical connector system. 4,544,903, Cl. 335-205.000.
Graves, Daniel F.; and Snyder, Dennis L., to Firestone Tire & Rubber Company, The. Method for purifying cyclic dichlorophosphazene trimer of catalytic impurities. 4,544,537, Cl. 423-300.000.
Gray, George W.: *See—*
Abdullah, Hilal M.; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Toyne, Kenneth J., 4,544,497, Cl. 252-299.500.
Gray, Richard K.: *See—*
Foister, Robert T.; and Gray, Richard K., 4,544,432, Cl. 156-307.300.
Green, William P.: *See—*
Hattan, Mark, 4,543,945, Cl. 126-438.000.
Grendahl, Dennis T.: *See—*
Drake, Anthony F.; Masse, Fernard J.; and Grendahl, Dennis T., 4,543,673, Cl. 623-6.000.
Greune, Christian; and Holzhauer, Hilbert, to Motoren-und Turbien-Union Munchen. Apparatus for the displacement of thrust reversers of two jet engines of an airplane. 4,543,783, Cl. 60-226.200.
Gries, Josef: *See—*
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.
Grimsland, Michael. Method and device for rapidly measuring frequency response of electronic test objects. 4,544,883, Cl. 324-77.0CS.
Grisar, Ulrich: *See—*
Berstermann, Wilhelm; Grisar, Ulrich; and Koerfer, Egon, 4,544,270, Cl. 356-313.000.
Griswold, Charles F.; and Christolini, Ben A., Jr., to Union Oil Company of California. Process for staged combustion of retorted oil shale. 4,543,894, Cl. 110-347.000.
Grohe, Klaus: *See—*
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,544,658, Cl. 514-254.000.
Grossberndt, Hermann, to EJOT Eberhard Jaeger GmbH & Co. KG. Self-tapping screw. 4,544,313, Cl. 411-411.000.
Grossiord, Claude R., to S. T. Dupont. Ball point pen venting. 4,544,297, Cl. 401-217.000.
Grot, Walther G.; Molnar, Charles J.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Fluorinated ion exchange polymer containing carboxylic groups, process for making same, and film and membrane thereof. 4,544,458, Cl. 204-98.000.
Gruber, Reinhold; and Rathel, Dieter, to Webasto-Werk W. Baier GmbH & Co. Heater fired with liquid fuel. 4,543,943, Cl. 126-350.00R.
Gruber, Wolfgang: *See—*
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Grumman Aerospace Corporation: *See—*
Mockovciak, John, Jr., 4,543,761, Cl. 52-655.000.
Pernick, Benjamin J., 4,544,898, Cl. 332-7.510.
Grunikiewicz, Peter; Gommel, Karl; and Junginger, Klaus M., to C. & E. Fein GmbH & Co. Cutting tool. 4,543,720, Cl. 30-272.00R.
Grusdt, Rainer: *See—*
Walter, Kurt; Gokorsch, Wilfried; Kurth, Gunter; Grusdt, Rainer; and Schreiter, Manfred, 4,543,770, Cl. 53-511.000.
GTE Automatic Electric Incorporated: *See—*
Tarleton, George K., 4,544,850, Cl. 307-269.000.
GTE Communication Systems Corporation: *See—*
Koppensteiner, James V.; and Kaczkos, John E., 4,544,066, Cl. 211-41.000.
GTE Laboratories Incorporated: *See—*
Bencuya, Izak; and Cogan, Adrian I., 4,543,706, Cl. 29-571.000.
Kamieniecki, Emil, 4,544,887, Cl. 324-158.00R.
GTE Products Corporation: *See—*
English, George J.; and Levin, Robert E., 4,545,001, Cl. 362-340.000.
Fraley, Lawrence R.; and Westlund, Arnold E., Jr., 4,545,000, Cl. 362-304.000.
Hidler, Henry; Davey, Ernest; Hope, Lawrence L.; and Shimer, Robert, 4,544,091, Cl. 228-124.000.
GTE Valeron Corporation: *See—*
Cusack, Robert F., 4,543,859, Cl. 81-484.000.
Guendling, Fred W., Jr. Training aid for hitting golf ball. 4,544,161, Cl. 273-187.00A.
Guest, Andrew J.; and Washington, Derek, to U.S. Philips Corporation. Laminated channel plate electron multiplier. 4,544,860, Cl. 313-103.0CM.
Gulf Oil Corporation: *See—*
Taylor, James L., 4,544,477, Cl. 208-11.00R.
Gully, John H.: *See—*
Weldon, William F.; and Gully, John H., 4,544,874, Cl. 322-10.000.
Gunn, Mary M. Rear cover for pickup truck with attached rigid camper enclosure. 4,544,195, Cl. 296-26.000.
Gupta, Tapan K.: *See—*
Blewitt, Donald D.; and Gupta, Tapan K., 4,544,908, Cl. 337-279.000.
Gupta, Vijai P., to Atlantic Richfield Company. Stripping of unreacted glycol ethers and acids from an esterification reaction mixture. 4,544,453, Cl. 203-44.000.
Guterman, Daniel C.; and Jiang, Ching-Lin, to Mostek Corporation. Dynamic RAM with nonvolatile shadow memory. 4,545,035, Cl. 365-185.000.
Guttag, Karl M.: *See—*
Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, 4,544,851, Cl. 307-480.000.
Guttinger, Hannes: *See—*
Troup, Alan; Strassler, Sigfrid; Guttinger, Hannes; and Pfister, Gustav, 4,543,815, Cl. 73-28.000.
Guzenko, Stanislav I.: *See—*
Fomin, Viktor I.; Guzenko, Stanislav I.; Egai, Mikhail N.; and Manenkov, Jury A., 4,545,042, Cl. 367-189.000.
Gyurko, Istvan; Czeininger, Csaba; Mosko, Karoly; and Nagy, Ferenc, to Mecseki Szenbanyak. Sound-insulating leather powder compositions. 4,544,676, Cl. 521-84.100.
Haaf, William R., to General Electric Company. High impact thermoplastic compositions containing diblock impact modifier. 4,544,703, Cl. 525-92.000.
Haag, William G.: *See—*
Chavdarian, Charles G.; and Haag, William G., 4,544,651, Cl. 514-120.000.
Hachinohe Kanzume Co., Ltd.: *See—*
Komukai, Chogo, 4,544,561, Cl. 426-104.000.
Hackenbeck, Dietmar; and Marx, Hans-Jurgen, to Trutzschler GmbH & Co. Kg. Suction apparatus for removing fiber material in a bale opener. 4,544,106, Cl. 241-101.00A.
Hackler, Ronald E.: *See—*
Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., 4,544,752, Cl. 548-214.000.
Hadley, Michael S.; and King, Francis D., to Beecham Group p.l.c. Pharmaceutically active tropanes. 4,544,660, Cl. 514-329.000.
Haferl, Peter E., to RCA Corporation. Switched vertical deflection circuit with bidirectional power supply. 4,544,864, Cl. 315-393.000.
Hagen, Alexander: *See—*
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Hagen, Helmut; and Kohler, Rolf-Dieter, to Basf Aktiengesellschaft. Cleavage of phthalimides to amines. 4,544,755, Cl. 548-335.000.
Hagestam, Helene I.: *See—*
Pinkerton, Thomas C.; and Hagestam, Helene I., 4,544,485, Cl. 210-502.100.
Hagiwara, Masaaki: *See—*
Ukigai, Toshiyuki; Hagiwara, Masaaki; and Yamada, Junichi, 4,544,033, Cl. 166-274.000.
Haglund, Richard A.; and Tupack, Robert E., to Teledyne Industries, Inc. Airtight telescoping rigid conduit. 4,543,677, Cl. 14-71.500.
Hahn, William F.; McAdams, Hiramie T.; and Talley, Robert L., to Penn Virginia Corporation. Differential rate screening. 4,544,101, Cl. 241-24.000.
Hahn, William F.; and McAdams, Hiramie T., to Penn Virginia Corporation. Differential rate screening. 4,544,102, Cl. 241-24.000.
Hahnsen, Heinrich: *See—*
Kaminsky, Walter; and Hahnsen, Heinrich, 4,544,762, Cl. 556-179.000.
Haines, Allan B. Refuse container. 4,544,320, Cl. 414-511.000.
Hair, Roberta A. Interlocking slab element for covering the ground and the like. 4,544,305, Cl. 404-41.000.
Hakoopian, Hakop M., to Harris Corporation. Short circuit protector/-controller circuit. 4,544,981, Cl. 361-93.000.
Halliday, Mary M.; and Jackson, Glen R., to Phillips Petroleum Company. Control of a fractional distillation process. 4,544,452, Cl. 203-1.000.
Hallmark Cards, Inc.: *See—*
Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., 4,544,218, Cl. 339-31.00L.

Halseth, William L.: *See*—
Elliott, Donald P.; and Halseth, William L., 4,544,370, Cl. 604-319.000.
Halvorsen, Finn, to Scanding Byggkonsult Aktiebolag. Flexible terminal point for lattice work construction. 4,543,762, Cl. 52-660.000.
Hamada, Masao: *See*—
Nishi, Yasutaka; Hamada, Masao; Ishikawa, Yoshihide; and Inoue, Setsuo, 4,544,608, Cl. 428-498.000.
Hamakawa, Yoshihiro: *See*—
Tsuge, Kazunori; Tawada, Yoshihisa; and Hamakawa, Yoshihiro, 4,544,423, Cl. 148-174.000.
Hamamoto, Takashi: *See*—
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, 4,544,580, Cl. 427-261.000.
Hamana, Ryozo: *See*—
Ayusawa, Tadashi; Aoki, Tadamichi; and Hamana, Ryozo, 4,544,749, Cl. 546-184.000.
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Engine starter. 4,543,923, Cl. 123-179.00F.
Hamilton, John W.: *See*—
Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., 4,544,189, Cl. 292-50.000.
Hamlin, Jerry J. Intrusion detector and method. 4,544,920, Cl. 340-565.000.
Hampton, James K.: *See*—
Bednar, Richard D.; and Hampton, James K., 4,543,850, Cl. 74-512.000.
Han, Doyoung; and Hansen, William G., to American Standard Inc. Control and method for tempering supply air. 4,543,796, Cl. 62-160.000.
Handel, Manfred: *See*—
Sonneborn, Siegfried; Handel, Manfred; and Mack, Ernst, 4,543,753, Cl. 52-15.000.
Handy, Richard L.; and Lutenegger, Alan J., to Iowa State University Research Foundation, Inc. Tapered blade in situ soil testing device. 4,543,820, Cl. 73-84.000.
Hann, Paul D.: *See*—
Hutson, Tom, Jr.; and Hann, Paul D., 4,544,777, Cl. 568-697.000.
Hannes, Hellmut: *See*—
Claussen, Uwe; Hannes, Hellmut; and Weber, Hans-Leo, 4,544,583, Cl. 428-1.000.
Hans, Rudiger; and Friedrich, Wolfgang, to SKF Kugellagerfabriken GmbH. Seal between rotating concentric elements. 4,544,168, Cl. 277-84.000.
Hansen, William G.: *See*—
Han, Doyoung; and Hansen, William G., 4,543,796, Cl. 62-160.000.
Hapke, Walter: *See*—
Diepholz, Tilo; Hapke, Walter; Wohl, Wilhelm; and Schindler, H.-Joachim, 4,544,965, Cl. 360-71.000.
Harada, Kunimitsu: *See*—
Suzuki, Hirofumi; Waki, Masahiko; and Harada, Kunimitsu, 4,544,288, Cl. 400-121.000.
Haraguchi, Keisuke; and Kando, Toru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Compact camera. 4,544,251, Cl. 354-288.000.
Harata, Mituo: *See*—
Yamashita, Youhachi; Takahashi, Takashi; and Harata, Mituo, 4,544,644, Cl. 501-134.000.
Harbridge, John B., to Beecham Group p.l.c. Derivatives of clavulanic acid, their preparation and their use. 4,544,549, Cl. 424-114.000.
Harima Chemicals, Inc.: *See*—
Nishi, Yasutaka; Hamada, Masao; Ishikawa, Yoshihide; and Inoue, Setsuo, 4,544,608, Cl. 428-498.000.
Harmon, Albert D.: *See*—
Koella, Ernest, III; and Harmon, Albert D., 4,543,778, Cl. 57-303.000.
Harnisch, Horst: *See*—
Claussen, Uwe; and Harnisch, Horst, 4,544,496, Cl. 252-301.350.
Harrell, William C.: *See*—
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,544,396, Cl. 65-178.000.
Harris Corporation: *See*—
Davis, Robert C., 4,545,054, Cl. 371-43.000.
Hakoopian, Hakop M., 4,544,981, Cl. 361-93.000.
Harris, David L., to Tektronix, Inc. Mount for millimeter wave application. 4,544,902, Cl. 333-250.000.
Harris, James E.: *See*—
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,544,396, Cl. 65-178.000.
Harris, Kenneth M., to Lucas Industries Public Limited Company. Fuel pumping apparatus. 4,543,914, Cl. 123-41.310.
Harris-Thomas Drop Forge Company, The: *See*—
Theobald, Donald L., 4,543,812, Cl. 72-354.000.
Hartman, Johan E. A.: *See*—
van Baardewijk, Johannes; Bohlmeyer, Nicolaas; and Hartman, Johan E. A., 4,545,050, Cl. 370-62.000.
Hartmann, Rolf; Krah, Albrecht; Egle, Hilda; and Ziegler, Rudolf, to Battelle-Institut e.V. Method of making a bolometric radiation detector. 4,544,441, Cl. 156-634.000.
Harui, Norio; and Souquet, Jacques, to Advanced Technology Laboratories, Inc. Transesophageal echo cardiography scanhead. 4,543,960, Cl. 128-660.000.
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, to Canon Kabushiki Kaisha. Method for recording by writing or printing with ink. 4,544,580, Cl. 427-261.000.
Harvey Hubbell Incorporated: *See*—
Barkas, Emanuel E., 4,544,219, Cl. 339-40.000.
Harvey, Roy L.: *See*—
Galvin, Aaron A.; Harvey, Roy L.; and Leff, Kenneth J., 4,544,836, Cl. 235-487.000.
Hasegawa, Mikio: *See*—
Suzuki, Masaki; and Hasegawa, Mikio, 4,545,021, Cl. 364-571.000.
Hasegawa, Takashi: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.
Hasegawa, Toshiaki; and Hirose, Yasuo, to Nippon Furnace Kogyo Kaisha, Ltd. Measurement of velocity in water flow model. 4,543,834, Cl. 73-861.050.
Haselmaker, Karl, to Metallgesellschaft Aktiengesellschaft. Horizontal flow electrostatic precipitator with gas distributor receiving downward gas flow. 4,544,383, Cl. 55-129.000.
Hashimoto, Kazuo: *See*—
Okado, Hideo; Hashimoto, Kazuo; Kawamura, Kichinari; Yamazaki, Yasuyoshi; and Takaya, Haruo, 4,544,793, Cl. 585-640.000.
Hashimoto, Ken. Power supply apparatus for fluorescent lamp. 4,544,863, Cl. 315-209.00R.
Hashimoto, Osamu: *See*—
Irie, Toshio; Sato, Susumu; and Hashimoto, Osamu, 4,544,419, Cl. 148-12.00C.
Hashimoto, Yasuyuki; and Shimizu, Kazuo, to Ancos Co., Ltd. Mechanical pencil with self-contained insert. 4,544,295, Cl. 401-65.000.
Hastings, Donald R.; Herstek, Glen A.; and Scarbrough, Don R., to Nordson Corporation. Method of reducing corona discharge in an electrostatic spray gun. 4,543,710, Cl. 29-613.000.
Hatakeyama, Iwao: *See*—
Ishii, Osamu; Yoshimura, Fumikatsu; and Hatakeyama, Iwao, 4,544,612, Cl. 428-692.000.
Hatsuse, Toshikazu: *See*—
Ode, Sadao; Hatsuse, Toshikazu; and Shiina, Hiroshi, 4,543,692, Cl. 24-616.000.
Hattan, Mark, to Green, William P., a part interest. Structure and manufacture of radiation collectors. 4,543,945, Cl. 126-438.000.
Hattori, Seiichi: *See*—
Komiya, Hidetsugu; and Hattori, Seiichi, 4,544,971, Cl. 360-96.500.
Hauk, Waldemar; Krull, Klaus; and Welzenbach, Manfred, to Licentia Patent-Verwaltungs-GmbH. Service integrated digital transmission system. 4,545,048, Cl. 370-1.000.
Hauni-Werke Korber & Co. K.G.: *See*—
Brand, Peter; Lorenzen, Heinz-Christen; Heitmann, Uwe; and Menzel, Peter, 4,543,816, Cl. 73-37.600.
Hausch, Walter R., to Firestone Tire & Rubber Company, The. Application of ambient temperature cured polymers or prepolymers to a cured elastomer. 4,544,427, Cl. 156-97.000.
Haussman, Wolfgang, to Siemens Aktiengesellschaft. Adjustment-free drive circuit for color television picture tubes. 4,544,947, Cl. 358-65.000.
Hawerkamp, Manfred. Heatable winding drum construction for use in manufacturing plastic tubes and receptacles. 4,544,435, Cl. 156-428.000.
Hawley, Gil R., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,544,716, Cl. 526-119.000.
Hayakawa, Kimiaki: *See*—
Kitajima, Tadayuki; Hayakawa, Kimiaki; Ueda, Noriyoshi; and Hiroi, Masakazu, 4,544,148, Cl. 271-3.100.
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Suyama, Takahiro; and Yano, Seiki, to Sharp Kabushiki Kaisha. Window structure of a semiconductor laser. 4,545,057, Cl. 372-45.000.
Hayashi, Kanji: *See*—
Muraki, Ryoji; Numata, Seiiti; and Hayashi, Kanji, 4,545,009, Cl. 364-164.000.
Hayashi, Koichi: *See*—
Itoh, Shuji; and Hayashi, Koichi, 4,544,436, Cl. 156-549.000.
Hayashi, Masaharu: *See*—
Yamaguchi, Hiroji; Hayashi, Masaharu; and Itakura, Masato, 4,544,053, Cl. 192-58.00B.
Hayashi, Mishio, to Takeda Riken Co., Ltd. Period and frequency measuring instrument. 4,544,884, Cl. 324-78.00R.
Hayashi, Nobuyuki: *See*—
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, 4,544,625, Cl. 430-284.000.
Hayes, Stanley G.: *See*—
Ebert, Russell L.; and Hayes, Stanley G., 4,544,170, Cl. 280-21.00R.
Hazel, Robert L.: *See*—
Burns, Kenneth R.; and Hazel, Robert L., 4,544,964, Cl. 360-51.000.
Healy, Mark; and Gerdes, Jerry D., to Senniger Irrigation, Inc. Pressure regulator. 4,543,985, Cl. 137-505.250.
Heck, James V.: *See*—
Andrus, W. Alexander; Christensen, Burton G.; and Heck, James V., 4,544,557, Cl. 514-210.000.
Heffner, Robert E.; and Davidson, John J., to Aluminum Company of America. Electrocoating apparatus. 4,544,475, Cl. 204-300.0EC.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Polymeric cyanate compositions. 4,544,704, Cl. 525-108.000.
Hehl, Karl. Attachment mechanism for interchangeable injection molding dies. 4,544,340, Cl. 425-183.000.
Heidemeyer, Paulus: *See*—
Oetting, Hermann; Heidemeyer, Paulus; and Zimmermann, Frank, 4,543,855, Cl. 74-859.000.

Heil-Quaker Corporation: *See*—
Tomlinson, Ronald S.; and Trent, Bryan O., 4,543,892, Cl. 110-203.000.
Heilig, Klemens: *See*—
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, 4,544,524, Cl. 419-9.000.
Heilman, Gregory P., to Eaton Corporation. Device for calibrating torque transducers. 4,543,814, Cl. 73-1.00C.
Heinisch, Herbert: *See*—
Engel, Walter; and Heinisch, Herbert, 4,544,769, Cl. 564-242.000.
Heinrich, Bernd: *See*—
Kessler, Jochem; and Heinrich, Bernd, 4,543,933, Cl. 123-361.000.
Heinzl, Joachim, to Siemens Aktiengesellschaft. Apparatus and method for ink droplet ejection for a printer. 4,544,933, Cl. 346-140.00R.
Heinzle, August. Shuttle embroidering machine. 4,543,897, Cl. 112-221.000.
Heise, Klaus-Peter; Kuth, Robert; Neufang, Karl; Pantke, Hellmuth; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for improving the light fastness of polyamide dyeings. 4,544,372, Cl. 8-602.000.
Heisey, Raymond K., Jr.: *See*—
Barker, W. David; Heisey, Raymond K., Jr.; and Mariano, Arturo C., 4,543,760, Cl. 52-544.000.
Heitmann, Uwe: *See*—
Brand, Peter; Lorenzen, Heinz-Christen; Heitmann, Uwe; and Menzel, Peter, 4,543,816, Cl. 73-37.600.
Helioui, Moncef: *See*—
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, 4,544,536, Cl. 423-300.000.
Helix Technology Corporation: *See*—
Bertsch, Peter K., 4,543,792, Cl. 62-6.000.
Chellis, Fred F.; and Moschetto, Samuel J., 4,543,793, Cl. 62-6.000.
Helmick, James L., to Shaver Manufacturing Co. Tractor mounted hydraulic control mechanism for an earth working tool. 4,544,176, Cl. 280-481.000.
Henderson, David J.: *See*—
Fitter, Johan C.; and Henderson, David J., 4,544,004, Cl. 141-31.000.
Hendriks, Ferdinand; and Taylor, Russell H., to International Business Machines Corporation. Robot precision probe positioner with guidance optics. 4,544,889, Cl. 324-158.00P.
Henkel Corporation: *See*—
Kordosky, Gary A.; Sudderth, R. Brantley; Sierakoski, J. Michael; and MacKay, Kenneth D., 4,544,532, Cl. 423-24.000.
Henriksson, Goran, to Olsbergs Hydraulic AB. Electrohydraulic set device. 4,543,874, Cl. 91-387.000.
Henriquez, Theodore A.: *See*—
Tims, Allan C.; and Henriquez, Theodore A., 4,545,041, Cl. 367-157.000.
Henry, Georges; and Kieffer, Jean, to Merlin Gerin. Process for assembling a clad busbar of an electrical installation. 4,543,712, Cl. 29-825.000.
Hepner, Timothy E.; and Meyers, James F., to United States of America, National Aeronautics and Space Administration. Auto covariance computer. 4,545,025, Cl. 364-728.000.
Herbert, Eric D., to Tennant Radiant Heat Limited. Artificial fuel-effect gas fires. 4,544,347, Cl. 431-125.000.
Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., to AT&T Bell Laboratories. Conference control transfer arrangement. 4,544,804, Cl. 179-18.0BC.
Herscovici, Harry, to Cordis Corporation. Biphasic cardiac pacer. 4,543,956, Cl. 128-419.0PG.
Herslow, Ernst H., to Nils Weibull AB. Apparatus for automatically and continuously withdrawing coal from a ship's bunker. 4,544,316, Cl. 414-144.000.
Herstek, Glen A.: *See*—
Hastings, Donald R.; Herstek, Glen A.; and Scarbrough, Don R., 4,543,710, Cl. 29-613.000.
Herzan, Eugene H.: *See*—
Johnson, Lyle R.; and Herzan, Eugene H., 4,543,994, Cl. 137-614.040.
Hessberger, Gerhard: *See*—
Munz, Wolf D.; and Hessberger, Gerhard, 4,544,468, Cl. 204-192.00R.
Hetrick, Robert E., to Ford Motor Company. Electrochemical photocatalytic structure. 4,544,470, Cl. 204-248.000.
Hewig, Gert, to NUKEM GmbH. Method for preventing short-circuits or shunts in a large area thin film solar cell and cell obtained thereby. 4,544,797, Cl. 136-249.000.
Hewlett-Packard Company: *See*—
Maeda, Koichi; and Ito, Haruo, 4,544,879, Cl. 324-57.00R.
Ware, Frederick A., 4,545,028, Cl. 364-760.000.
Heyl, Walter; and Loffler, Thomas, to Linde Aktiengesellschaft. Axial piston machine having adjustable hydrostatically supported swash-plate. 4,543,876, Cl. 91-506.000.
Heyland, Sven; Fournet, Gaston; and Bosch, Hans, to Nestec S. A. Cheese flavoring product. 4,544,568, Cl. 426-650.000.
Hicks, Clayton J.: *See*—
Kellett, Roger N.; and Hicks, Clayton J., 4,544,119, Cl. 248-58.000.
Hide, Ichiro, to Hoxan Corporation. Apparatus for producing polyacetylene film. 4,544,343, Cl. 425-224.000.
Hidler, Henry; Davey, Ernest; Hope, Lawrence L.; and Shimer, Robert, to GTE Products Corporation. Target bonding process. 4,544,091, Cl. 228-124.000.
Hileman, Ronald E., to Sylvania Electric Products Inc. Synchronizing system. 4,545,061, Cl. 375-119.000.
Hill, James J.; and Marven, Al, to Cook International, Inc. Ornament including automatic and adjustable valving mechanism. 4,544,086, Cl. 222-649.000.
Hill, Jeffrey A.: *See*—
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., 4,544,149, Cl. 271-107.000.
Hilliard, William G.: *See*—
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,544,396, Cl. 65-178.000.
Himori, Hirotsugu: *See*—
Dobashi, Akihiko; Ohta, Tomohisa; Himori, Hirotsugu; and Sekine, Hideo, 4,544,573, Cl. 427-44.000.
Hino, Masao: *See*—
Honda, Mitsuyasu; Hino, Masao; and Seto, Toru, 4,544,525, Cl. 422-171.000.
Hira, Yasuo: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.
Hirai, Kiyomiki; Takeuchi, Koji; Abe, Masahiro; and Ito, Nobuo, to Ajinomoto Co., Inc. Latent curing agents for epoxy resins. 4,544,733, Cl. 528-123.000.
Hirano, Hiroyuki; and Matsumoto, Keiichi, to Pioneer Electronic Corporation. Tracking servo control system for an information read-out system. 4,544,872, Cl. 318-632.000.
Hirano, Hiroyuki; Kurihara, Toshihiko; Akiba, Taichi; and Araki, Yositsugu, to Pioneer Electronic Corporation. Pick-up device positioning arrangement in an information disc player. 4,545,003, Cl. 369-43.000.
Hirano, Takahisa, to Mitsubishi Jukogyo Kabushiki Kaisha. Capability control apparatus for a compressor. 4,544,333, Cl. 417-299.000.
Hiroi, Masakazu: *See*—
Kitajima, Tadayuki; Hayakawa, Kimiaki; Ueda, Noriyoshi; and Hiroi, Masakazu, 4,544,148, Cl. 271-3.100.
Hirokane, Junji: *See*—
Ohta, Kenji; Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,544,443, Cl. 156-643.000.
Hirose Electric Co., Ltd.: *See*—
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,544,984, Cl. 361-119.000.
Hirose, Takao, to Allied Corporation. Shielded electrical connector. 4,544,227, Cl. 339-143.00R.
Hirose, Yasuo: *See*—
Hasegawa, Toshiaki; and Hirose, Yasuo, 4,543,834, Cl. 73-861.050.
Hishiyama, Sadao: *See*—
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.
Hitachi Chemical Company, Ltd.: *See*—
Dobashi, Akihiko; Ohta, Tomohisa; Himori, Hirotsugu; and Sekine, Hideo, 4,544,573, Cl. 427-44.000.
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, 4,544,625, Cl. 430-284.000.
Hitachi Engineering Co., Ltd.: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.
Hitachi, Ltd.: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.
Ichiryu, Ken; Watanabe, Haruo; and Yamaguchi, Takashi, 4,544,129, Cl. 251-129.010.
Kodama, Hideyo; Kondo, Yasuo; and Akahori, Kimihiko, 4,544,019, Cl. 164-496.000.
Maeda, Kunihiro; and Miyoshi, Tadahiko, 4,544,642, Cl. 501-88.000.
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.
Nagatomo, Hiroto; Maejima, Hisashi; Suzuki, Jun; and Fujikawa, Keishin, 4,544,318, Cl. 414-222.000.
Nate, Kazuo; Inoue, Takashi; Yokono, Hitoshi; Ishikawa, Mitsuo; and Kumada, Makoto, 4,544,729, Cl. 528-28.000.
Osawa, Michitaka; Funada, Etuo; Miyajima, Hiroyuki; Maekawa, Hitoshi; and Ando, Kunio, 4,544,896, Cl. 330-284.000.
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,544,615, Cl. 429-194.000.
Sugiyama, Sakae, 4,543,817, Cl. 73-40.50A.
Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, 4,544,338, Cl. 418-63.000.
Wada, Takeshi; Kita, Hisanao; Wada, Tatsuji; Fujishima, Susumu; and Kadowaki, Hironori, 4,543,711, Cl. 29-726.000.
Hitachi, Ltd: *See*—
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.
Hitachi Maxell Ltd.: *See*—
Maehara, Yoshimi, 4,544,062, Cl. 206-509.000.
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.
Hitomi, Mitsuo; and Oda, Hiroyuki, to Mazda Motor Corporation. Engine intake system. 4,543,931, Cl. 123-308.000.

Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, to American Cyanamid Company. Platinum complexes of antitumor agents. 4,544,759, Cl. 556-36.000.

Hnat, James G. Vortex process for melting glass. 4,544,394, Cl. 65-27.000.

Ho, Giong. Liquid level control apparatus and method. 4,543,973, Cl. 137-1.000.

Hobart Corporation: *See*—
Boshinski, Edwin E., 4,543,766, Cl. 53-64.000.

Hoberman, Max. Exit sign lamp flashing system with self-checking provisions. 4,544,910, Cl. 340-333.000.

Hochanadel, Thomas A.; and McInerney, Robert J., to J. E. Grote Company. Stacking conveyor for product slicing machine. 4,543,864, Cl. 83-91.000.

Hochstein, Peter A., to Armada Corporation. Bistable shape memory effect thermal transducers. 4,544,988, Cl. 361-211.000.

Hoechst Aktiengesellschaft: *See*—
Ehmann, Werner; Homanner, Alfons; and Rinno, Helmut, 4,544,689, Cl. 524-52.000.
Kaminsky, Walter; and Hahnsen, Heinrich, 4,544,762, Cl. 556-179.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Klioze, Solomon S., 4,544,745, Cl. 546-89.000.
Tegeler, John J.; and Diamond, Craig J., 4,544,753, Cl. 548-245.000.

Hoeck, Horst. Bottle sterilizer. 4,544,529, Cl. 422-303.000.

Hoelzer, Robert J., to Manville Service Corporation. Insulation jacketing material. 4,544,685, Cl. 523-200.000.

Hoff, Raymond E.: *See*—
Pullukat, Thomas J.; and Hoff, Raymond E., 4,544,646, Cl. 502-109.000.

Hoffman, David L., to General Electric Company. Magnetic friction device. 4,544,048, Cl. 188-251.00A.

Hoffman-La Roche Inc.: *See*—
Brombacher, Urs; Montavon, Marc; Bretschneider, Hermann; Schantl, Joachim; and Turk, Wolfgang, 4,544,659, Cl. 514-297.000.

Hoffmann, Horst: *See*—
Linkert, Reinhold; Becker, Emil; and Hoffmann, Horst, 4,544,407, Cl. 75-130.00A.

Hoffmann-La Roche Inc.: *See*—
Adam-Molina, Solange, 4,544,748, Cl. 546-167.000.
Broger, Emil A., 4,544,770, Cl. 568-9.000.
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,544,655, Cl. 514-222.000.

Hoffmann, Matthias: *See*—
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, 4,544,524, Cl. 419-9.000.

Holbrook, Glenn E. Clamp for a tooling ball and a method for establishing a plane for lay-out purposes. 4,543,729, Cl. 33-293.000.

Holcomb, James R.: *See*—
Ware, Joseph W., III; DeBernardi, James A.; and Holcomb, James R., 4,544,350, Cl. 431-285.000.

Holland, Graham J.: *See*—
Bostock, Philip G.; and Holland, Graham J., 4,543,924, Cl. 123-195.00A.

Holsinger, Jerry L.: *See*—
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,011, Cl. 364-200.000.
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,013, Cl. 364-200.000.

Holtje, Wilfried G., to Ciba-Geigy Corporation. Process for preparing 2-anilinoacridone. 4,544,746, Cl. 546-103.000.

Holtman, Dennis C., to Personal Products Company. Stabilized absorbent structure containing non-delignified wood pulp fibers. 4,544,596, Cl. 428-171.000.

Holzer, Karl: *See*—
Scheurecker, Werner; Holzer, Karl; Engel, Kurt; and Schubert, Hermann, 4,544,015, Cl. 164-442.000.

Holzhauer, Hilbert: *See*—
Greune, Christian; and Holzhauer, Hilbert, 4,543,783, Cl. 60-226.200.

Homanner, Alfons: *See*—
Ehmann, Werner; Homanner, Alfons; and Rinno, Helmut, 4,544,689, Cl. 524-52.000.

Hombak Maschinenfabrik GmbH & Co. KG: *See*—
Krocher, Harro, 4,544,009, Cl. 144-230.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Maru, Hideki; and Mitsui, Tetsuro, 4,544,180, Cl. 280-689.000.
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,543,849, Cl. 74-501.50R.

Honda, Mitsuyasu; Hino, Masao; and Seto, Toru, to Mitsubishi Jukogyo Kabushiki Kaisha. Solid gas contact reactor. 4,544,525, Cl. 422-171.000.

Honeywell Inc.: *See*—
Dietiker, Paul; Kim, Yong C.; Nelson, Marvin D.; and Olson, Elwyn H., 4,543,974, Cl. 137-66.000.

Honeywell Information Systems Inc.: *See*—
Salas, Edward R.; Fisher, Edwin P.; Johnson, Robert B.; Nibby, Chester M., Jr.; and Boudreau, Daniel A., 4,545,010, Cl. 364-200.000.

Hong-Yue, Du. Antipeptic ulcer composition. 4,544,551, Cl. 424-147.000.

Hood, Christopher: *See*—
Newport, Derek J.; and Hood, Christopher, 4,544,834, Cl. 235-487.000.

Hood, Rush W.: *See*—
Medero, Richard; Hood, Rush W.; Apple, Howard P.; and Ramsey, Maynard, III, 4,543,962, Cl. 128-682.000.

Hope, Lawrence L.: *See*—
Hidler, Henry; Davey, Ernest; Hope, Lawrence L.; and Shimer, Robert, 4,544,091, Cl. 228-124.000.

Horn, Darrell C.; and Fletcher, Jeffery N., to Up-Right, Inc. Method and apparatus for pruning cordon-trained grape vines. 4,543,775, Cl. 56-235.000.

Hornung, Steve, to Kenhar Products Incorporated. Quickchange fork. 4,544,324, Cl. 414-785.000.

Horodeck, Richard A., to Cornell Research Foundation, Inc. Method and apparatus for typing Japanese text using multiple systems. 4,544,276, Cl. 400-110.000.

Horvath, Istvan: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.

Horvay, Julius B.; and Gelbard, Robert B., to General Electric Company. Household refrigerator with air circulating and cooling arrangement. 4,543,799, Cl. 62-283.000.

Howard, H. Taylor, to Chaparral Communications, Inc. Polarized signal receiver system. 4,544,900, Cl. 333-21.00A.

Howeth, D. Franklin. Multiple jet backflushed air filter. 4,544,389, Cl. 55-302.000.

Hoxan Corporation: *See*—
Hide, Ichiro, 4,544,343, Cl. 425-224.000.

Hozumi, Motoo; Tsushima, Susumu; and Yoshioka, Yoshio, to Takeda Chemical Industries, Ltd. Tridecyloxy- or tetradecyloxy-propane derivatives. 4,544,512, Cl. 260-925.000.

Hromatka, Otto: *See*—
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,544,655, Cl. 514-222.000.

Hsiao-Ming, Chen: *See*—
Ying-Ming, Tsai; Hsiao-Ming, Chen; and Gann, Ting, 4,544,530, Cl. 423-10.000.

Hsieh, Henry L.: *See*—
Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., 4,544,718, Cl. 526-141.000.

Huber, Leonhard: *See*—
Nagel, Erich; Huber, Leonhard; and Lammel, Gunter, 4,544,110, Cl. 242-67.10R.

Hubert, Alvin I. Truck tractor towing apparatus. 4,544,175, Cl. 280-402.000.

Hubner, Heinz-Joachim: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,544,742, Cl. 544-8.000.

Hudelmaier, Gerhard, to Hudelmaier, Ingrid. Concrete mixer truck. 4,544,275, Cl. 366-30.000.

Hudelmaier, Ingrid: *See*—
Hudelmaier, Gerhard, 4,544,275, Cl. 366-30.000.

Huettner, Robert E.: *See*—
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,011, Cl. 364-200.000.
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,013, Cl. 364-200.000.

Huggins, Dale K.: *See*—
Chou, Eddie C.; Wiegers, Ben W.; Huggins, Dale K.; and Wiewiorowski, Edward I., 4,544,541, Cl. 423-508.000.

Hughes Aircraft Company: *See*—
Gagnon, Ralph J., 4,544,237, Cl. 350-331.00R.

Hughes, Kenneth E.; Hutson, Timothy B.; and Fink, David J., to Battelle Development Corporation. Collagen orientation. 4,544,516, Cl. 264-108.000.

Hughins, James T. Fractional calculator. 4,545,022, Cl. 364-709.000.

Hui, Sai H., to Sun Chemical Corporation. Compounds and their use as insolubilizers for binders for paper coating compositions. 4,544,609, Cl. 428-507.000.

Humber, Leslie G.: *See*—
Demerson, Christopher A.; and Humber, Leslie G., 4,544,757, Cl. 548-432.000.

Humblot, Bernard. Welding apparatus using transformer with movable secondary and its method of manufacture and use. 4,544,821, Cl. 219-91.200.

Hunt, Alfred: *See*—
Elrick, Edwin, 4,544,079, Cl. 220-277.000.

Hunter Douglas Industries B.V.: *See*—
Anderson, Richard N., 4,543,699, Cl. 29-24.500.

Hunter, Steven L.: *See*—
Friedman, Ernest H.; Sanders, Gary G.; and Hunter, Steven L., 4,543,957, Cl. 128-630.000.

Husain, Anwar, to Micronix Partners. Mask alignment apparatus. 4,544,311, Cl. 409-224.000.

Hutschenreuther AG: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,544,345, Cl. 425-405.00R.

Hutson, Timothy B.: *See*—
Hughes, Kenneth E.; Hutson, Timothy B.; and Fink, David J., 4,544,516, Cl. 264-108.000.
Hutson, Tom, Jr.; and Hann, Paul D., to Phillips Petroleum Company. Combination alkylation-etherification process. 4,544,777, Cl. 568-697.000.
Huvet, Jean-Marie: *See*—
Serrie, Gerard J. J.; and Huvet, Jean-Marie, 4,544,980, Cl. 361-45.000.
Huveteau, Jean L., to S.A. Robinetterie, S.F.R. Stop which settles in a device bore. 4,543,988, Cl. 137-542.000.
Huyler, Lee E.: *See*—
Swank, Harry R.; Doggett, Fred F.; Huyler, Lee E.; and Sofia, Santo J., 4,544,955, Cl. 358-246.000.
Hydrel Ag: *See*—
Maurer, Martin, 4,544,108, Cl. 242-43.00R.
Hydromatik GmbH: *See*—
Schniederjan, Reinhold, 4,544,330, Cl. 417-218.000.
Iadarola, Ralph E.; Strassle, Warren F.; and Russo, Gene W., to Allied Corporation. Method of forming vertical traces on printed circuit board. 4,543,715, Cl. 29-852.000.
IBP, Inc.: *See*—
Couture, William F., 4,543,689, Cl. 17-46.000.
IBP Pietzsch GmbH: *See*—
Wecker, Dietmar; and Lippold, Heinrich, 4,543,727, Cl. 33-228.000.
Ichikawa, Shigeru, to Meisan Ltd., Co. Slitter knife holder. 4,543,867, Cl. 83-502.000.
Ichinose, Makoto: *See*—
Moriya, Mitsuro; and Ichinose, Makoto, 4,544,957, Cl. 358-338.000.
Ichiryu, Ken; Watanabe, Haruo; and Yamaguchi, Takashi, to Hitachi, Ltd. Direct-acting servo valve. 4,544,129, Cl. 251-129.010.
IGI Biotechnology, Inc.: *See*—
Keggins, Kathleen M.; Davis, Ann C.; Sybert, Edward M.; Mays, Thomas D.; and Milch, Robert A., 4,544,637, Cl. 435-253.000.
Ihochi, Akihiko: *See*—
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.
Iida, Shinobu: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,544,601, Cl. 428-330.000.
Ikado, Shuhei: *See*—
Ema, Kenji; Saito, Jun; Mitsuishi, Takatoshi; and Ikado, Shuhei, 4,544,727, Cl. 526-313.000.
Ikeda, Takaharu: *See*—
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,544,635, Cl. 435-121.000.
Ikeda, Tomoaki: *See*—
Takahashi, Yonosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,544,627, Cl. 430-325.000.
Illinois Tool Works Inc.: *See*—
Ernst, Richard J.; and Godsted, Kent B., 4,543,763, Cl. 52-698.000.
IMC Acrylguss GmbH: *See*—
Melchior, Bernd, 4,544,575, Cl. 427-74.000.
Imhof, Rainer, to Mannesmann Rexroth GmbH. Electro-hydraulic directional control valve. 4,543,875, Cl. 91-459.000.
Imhoff, Robert W. Automatically releasable locking electric plug. 4,544,216, Cl. 339-14.00P.
Imperial Chemical Industries: *See*—
Brittain, David R.; and Wood, Robin, 4,544,662, Cl. 514-374.000.
Imperial Chemical Industries PLC: *See*—
Bromley, Charles W.; Cooke, Brian A.; and Coombes, Norman A., 4,544,686, Cl. 523-411.000.
Imperial Clevite Inc.: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat A., 4,544,128, Cl. 251-30.010.
In Situ Technology, Inc.: *See*—
Terry, Ruel C., 4,544,037, Cl. 166-369.000.
INA Walzlager Schaeffler KG: *See*—
Basener, Helmut, 4,544,286, Cl. 384-486.000.
Parzefall, Walter; Pflugner, Wolfgang; and Steinberger, Wolfgang, 4,544,212, Cl. 308-6.00R.
Inaba, Naomi: *See*—
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,544,648, Cl. 502-119.000.
Inculet, Ion I.: *See*—
Plunkett, Robert T.; and Inculet, Ion I., 4,544,570, Cl. 427-27.000.
Infinet Inc.: *See*—
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,011, Cl. 364-200.000.
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,013, Cl. 364-200.000.
Ing. h.c.F. Porsche AG: *See*—
Kessler, Jochem; and Heinrich, Bernd, 4,543,933, Cl. 123-361.000.
Ingelmann, Hans-Joachim; and Kampf, Hans, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Evaporating apparatus. 4,543,802, Cl. 62-525.000.
Ingenjorsfirma G. Knutsson AB: *See*—
Knutsson, Lars G., 4,544,824, Cl. 219-121.0LG.
Innovative Concepts, Inc.: *See*—
Long, Jerry M.; and Womack, James A., 4,544,213, Cl. 312-183.000.
Inoue, Setsuo: *See*—
Nishi, Yasutaka; Hamada, Masao; Ishikawa, Yoshihide; and Inoue, Setsuo, 4,544,608, Cl. 428-498.000.
Inoue, Takashi: *See*—
Nate, Kazuo; Inoue, Takashi; Yokono, Hitoshi; Ishikawa, Mitsuo; and Kumada, Makoto, 4,544,729, Cl. 528-28.000.
Institut For Energetik Zentralstelle Fur Rationelle Energieanwendung: *See*—
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,544,650, Cl. 502-424.000.
Institut Francais du Petrole: *See*—
Dang Vu, Quang; Pradel, Claude; Euzen, Jean-Paul; and Le Page, Jean-Francois, 4,544,544, Cl. 423-659.000.
Juguin, Bernard; and Miquel, Jean, 4,544,791, Cl. 585-517.000.
Institut Mondial du Phosphate: *See*—
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, 4,544,536, Cl. 423-300.000.
Institute of Gas Technology: *See*—
Rehmat, Amirali G.; and Patel, Jitendra G., 4,544,375, Cl. 48-197.00R.
Institute of Nuclear Energy Research: *See*—
Ying-Ming, Tsai; Hsiao-Ming, Chen; and Gann, Ting, 4,544,530, Cl. 423-10.000.
Instrumentarium Oy: *See*—
Sepponen, Raimo, 4,543,959, Cl. 128-653.000.
Instruments S.A.: *See*—
Laude, Jean-Pierre, 4,544,232, Cl. 350-96.150.
Intamin Inc.: *See*—
Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons, 4,543,886, Cl. 104-53.000.
Intec Systems, Inc.: *See*—
Kitchin, David A., 4,545,030, Cl. 364-900.000.
Interimport F. Caceffo GmbH: *See*—
Luchetti, Lorenzo, 4,543,878, Cl. 99-330.000.
International Business Machines Corporation: *See*—
Anderson, Todd B.; Glaser, Thomas W.; and Neesz, John J., 4,544,968, Cl. 360-78.000.
Balliet, Layton; Wantshouse, Richard A.; and Wylie, Thomas J., 4,545,074, Cl. 455-601.000.
Bassetti, Larry W.; and Kantor, Sherwood, 4,544,264, Cl. 355-14.00R.
Carter, Donald L., 4,544,317, Cl. 414-217.000.
Chu, Wei-Kan; Pliskin, William A.; and Riseman, Jacob, 4,544,576, Cl. 427-82.000.
Gillett, John B., 4,544,223, Cl. 339-75.0MP.
Hendriks, Ferdinand; and Taylor, Russell H., 4,544,889, Cl. 324-158.00P.
Langner, Gunther O.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,544,846, Cl. 250-396.0ML.
Rudik, William J.; Schmitt, George P.; and Shipley, John F., 4,544,801, Cl. 174-68.500.
Solomon, Joseph M.; and Varker, Kenneth J., 4,544,439, Cl. 156-626.000.
International Flavors & Fragrances Inc.: *See*—
Fujoika, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,544,775, Cl. 568-675.000.
International Telephone & Telegraph Corp.: *See*—
Goodman, David S.; Selvin, Gerald J.; Naus, Hubert W.; Rofer, David; and McNutt, Randy A., 4,544,224, Cl. 339-89.00M.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Davis, Paul J.; and Reynolds, James F., 4,544,548, Cl. 424-93.000.
Smith, Richard D., 4,544,187, Cl. 285-256.000.
Inui, Masaki; and Yasui, Yasuyoshi, to Toyota Jidosha Kabushiki Kaisha. Transmission manipulation device for manual transmission. 4,543,844, Cl. 74-473.00R.
Inui, Masaki; and Yasui, Yasuyoshi, to Toyota Jidosha Kabushiki Kaisha. Interlocking construction in transmission manipulation device for manual transmission. 4,543,846, Cl. 74-477.000.
Inukai, Hiroshi: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Shimizu, Yoshiki, 4,544,720, Cl. 526-247.000.
Iodata, Inc.: *See*—
Mak, Stephen M., 4,545,032, Cl. 364-900.000.
Iowa State University Research Foundation, Inc.: *See*—
Handy, Richard L.; and Lutenegger, Alan J., 4,543,820, Cl. 73-84.000.
Irie, Toshio; Sato, Susumu; and Hashimoto, Osamu, to Kawasaki Steel Corporation. Method for producing high tensile strength cold rolled steel sheets having excellent formability and high tensile strength hot-dip galvanized steel sheets having excellent formability. 4,544,419, Cl. 148-12.00C.
Irvine, Robert; Luperti, Harry E.; and Bayliss, Keith, to Pitney Bowes Inc. Document feeder. 4,544,150, Cl. 271-145.000.
Isaacson, Calvin: *See*—
Christensen, Carl W.; and Isaacson, Calvin, 4,544,619, Cl. 430-258.000.
Ishida, Kunio; and Kaneko, Shinji, to Tokico Kabushiki Kaisha. Hydropneumatic spring. 4,544,144, Cl. 267-64.150.
Ishiguri, Yukio: *See*—
Sasaki, Mitsuru; and Ishiguri, Yukio, 4,544,652, C!. 514-127.000.
Ishii, Hisao: *See*—
Nomura, Yoshiyuki; Okuda, Kanemasa; and Ishii, Hisao, 4,544,819, Cl. 219-69.00W.
Ishii, Osamu; Yoshimura, Fumikatsu; and Hatakeyama, Iwao, to Nippon Telegraph & Telephone Public Corporation. Iron oxide magnetic film and process for fabrication thereof. 4,544,612, Cl. 428-692.000.

Ishikawa, Hiroshi; Tabasa, Fujio; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Company, Limited. Quinoline carboxylic acid derivatives. 4,544,747, Cl. 546-156.000.
Ishikawa, Mitsuo: *See*—
Nate, Kazuo; Inoue, Takashi; Yokono, Hitoshi; Ishikawa, Mitsuo; and Kumada, Makoto, 4,544,729, Cl. 528-28.000.
Ishikawa, Nobuyuki, to Sony Corporation. Crystal oscillator circuit with feedback control. 4,544,897, Cl. 331-116.00R.
Ishikawa, Yoshihide: *See*—
Nishi, Yasutaka; Hamada, Masao; Ishikawa, Yoshihide; and Inoue, Setsuo, 4,544,608, Cl. 428-498.000.
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, to Hitachi Chemical Company, Ltd. Photosensitive resin composition and photosensitive element. 4,544,625, Cl. 430-284.000.
Ishizumi, Kikuo: *See*—
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,544,635, Cl. 435-121.000.
Islam, Abul B. M. A.; and Bevan, David R., to Downs Surgical PLC. Biopsy needle. 4,543,966, Cl. 128-754.000.
Isover Saint-Gobain: *See*—
Potters, Michel, 4,543,690, Cl. 19-300.000.
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, to Mitsubishi Gas Chemical Company, Inc. Process for producing acetic anhydride. 4,544,511, Cl. 260-549.000.
Itakura, Masato: *See*—
Yamaguchi, Hiroji; Hayashi, Masaharu; and Itakura, Masato, 4,544,053, Cl. 192-58.00B.
Itami, Teruhiko; Kimoto, Toshifumi; Yamasawa, Akira; and Saitoh, Koichi, to Fuji Xerox Co., Ltd. Method of manufacturing a magnetic recording medium. 4,544,574, Cl. 427-48.000.
Ito, Haruo: *See*—
Maeda, Koichi; and Ito, Haruo, 4,544,879, Cl. 324-57.00R.
Ito, Kenichi: *See*—
Musha, Toru; and Ito, Kenichi, 4,544,838, Cl. 250-202.000.
Ito, Nobuo: *See*—
Hirai, Kiyomiki; Takeuchi, Koji; Abe, Masahiro; and Ito, Nobuo, 4,544,733, Cl. 528-123.000.
Ito, Toshiyo; and Ohshima, Jiro, to Kabushiki Kaisha. Method of forming through holes by differential etching of stacked silicon oxynitride layers. 4,543,707, Cl. 29-578.000.
Itoh, Masaru, to Toyoda Gosei Co., Ltd. Apparatus for vulcanization of rubber by dielectric heating. 4,544,339, Cl. 425-174.80R.
Itoh, Shuji; and Hayashi, Koichi, to Kyokuto Fatty-Acid Corporation. Apparatus for producing composite corrugating media for the manufacture of corrugated fiberboard and method of making same. 4,544,436, Cl. 156-549.000.
Itou, Zyouzi; and Akiyama, Synith, to Toyota Jidosha Kabushiki Kaisha. Air conditioner for a coating booth. 4,544,380, Cl. 55-80.000.
ITT Industries, Inc.: *See*—
Burgdorf, Jochen; and Steffes, Helmut, 4,543,791, Cl. 6-550.000.
Neal, Mathew; and Reimers, Jochen, 4,544,853, Cl. 307-530.000.
Ivan, Pal: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Iwamoto, Hiromu; and Tamada, Haruo, to Fujitsu Limited. Scale switchable digital-to-analog converter. 4,544,912, Cl. 340-347.0AD.
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, to Kokusai Denshin Denwa Co., Ltd. Underwater optical fiber connector. 4,544,233, Cl. 350-96.200.
Iwasaki, Masaru: *See*—
Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, 4,544,989, Cl. 361-401.000.
Iwata, Hiroshi: *See*—
Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, 4,544,338, Cl. 418-63.000.
Iwatsu Electric Co., Ltd.: *See*—
Takahashi, Toru, 4,544,885, Cl. 324-121.00R.
J. E. Grote Company: *See*—
Hochanadel, Thomas A.; and McInerney, Robert J., 4,543,864, Cl. 83-91.000.
J. T. Baker Chemical Co.: *See*—
Cady, Wayne A., 4,544,446, Cl. 156-639.000.
Jack Farrelly Company, The: *See*—
Farrelly, Robert E., 4,544,302, Cl. 404-2.000.
Jackson, Glen R.: *See*—
Halliday, Mary M.; and Jackson, Glen R., 4,544,452, Cl. 203-1.000.
Jacobs, Barry A., to Stauffer Chemical Company. Method of preventing scorch in a polyurethane foam and product thereof. 4,544,680, Cl. 521-128.000.
Jacoby, George V.; and Schwartz, Allan A., to Sperry Corporation. Read signal detection in ternary 3PM magnetic recording. 4,544,963, Cl. 360-40.000.
Jaecker, John A.: *See*—
Breder, E. William, Jr.; Jaecker, John A.; and Johnson, Marvin F. L., 4,544,786, Cl. 585-500.000.
Jameson, Joe P.: *See*—
Fehrenkamp, William; and Jameson, Joe P., 4,545,040, Cl. 367-76.000.
Jansen, Frank: *See*—
Mort, Joseph; Jansen, Frank; Grammatica, Steven J.; and Morgan, Michael A., 4,544,617, Cl. 430-58.000.
Jansen, Gerardus L. M.; and Vorspaget, Alexander, to U.S. Philips Corporation. Optical recording and/or reading device with spindle and optical elements supported on parallel bars. 4,545,046, Cl. 369-111.000.
Jansson, Arthur: *See*—
Akhagen, Rune; and Jansson, Arthur, 4,543,885, Cl. 102-373.000.
Janusz, John M.; Buckwalter, Brian L.; and LaHann, Thomas R., to Procter & Gamble Company, The. Compounds and compositions useful for producing analgesia. 4,544,668, Cl. 514-563.000.
Janusz, John M.: *See*—
LaHann, Thomas R.; Janusz, John M.; and Buckwalter, Brian L., 4,544,669, Cl. 514-563.000.
Jarvis, William A.; Kirby, John; Lane, Alan J.; Pokorski, John P.; and Sheffield, Wilbur L., to Scripto, Inc. Disposable propel-repel pencil. 4,544,296, Cl. 401-73.000.
Jensen, Gerald A.; and Euteneuer, Charles L., to Pako Corporation. Photographic slide mounter. 4,543,771, Cl. 53-520.000.
Jensen, Ole J.: *See*—
Eisenhardt, Anne R.; and Jensen, Ole J., 4,544,455, Cl. 204-1.00T.
Jeuch, Pierre; Lazzari, Jean-Pierre; and Parrens, Pierre, to Commissariat a l'Energie Atomique. Process for positioning an interconnection line on an electric contact hole of an integrated circuit. 4,544,445, Cl. 156-643.000.
Jiang, Ching-Lin: *See*—
Guterman, Daniel C.; and Jiang, Ching-Lin, 4,545,035, Cl. 365-185.000.
Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,544,742, Cl. 544-8.000.
Johanson, Donald L.: *See*—
Skakoon, James G.; Johanson, Donald L.; and Bonthron, Raymond J., 4,544,369, Cl. 604-155.000.
John, Heinz, deceased; and by John nee Rueffler, Friedlinde, Heir, to Lindauer Dornier Gesellschaft mbH. Device for separating and delivering individual heddles or drop wires to a draw-in position. 4,543,696, Cl. 28-206.000.
John Hopkins University, The: *See*—
Kitchin, David A., 4,545,030, Cl. 364-900.000.
John nee Rueffler, Friedlinde, Heir: *See*—
John, Heinz, deceased; and John nee Rueffler, Friedlinde, Heir, 4,543,696, Cl. 28-206.000.
Johns Hopkins University, The: *See*—
Keller, Christian A., 4,544,840, Cl. 250-227.000.
Johnson, Lyle R.; and Herzan, Eugene H., to Parker-Hannifin Corporation. Rigid mount coupler. 4,543,994, Cl. 137-614.040.
Johnson, Marvin F. L.: *See*—
Breder, E. William, Jr.; Jaecker, John A.; and Johnson, Marvin F. L., 4,544,786, Cl. 585-500.000.
Johnson Matthey Public Limited Company: *See*—
Newport, Derek J.; and Hood, Christopher, 4,544,834, Cl. 235-487.000.
Johnson, Paul R., to Shell Oil Company. Offshore crane wave motion compensation apparatus. 4,544,137, Cl. 254-337.000.
Johnson, Robert B.: *See*—
Salas, Edward R.; Fisher, Edwin P.; Johnson, Robert B.; Nibby, Chester M., Jr.; and Boudreau, Daniel A., 4,545,010, Cl. 364-200.000.
Johnson, Romain H. Die forming method and machine. 4,544,820, Cl. 219-69.00M.
Johnson, Theodore J. Wood fuel combustion system. 4,543,890, Cl. 110-102.000.
Johnston, Burdith W.: *See*—
Mawby, Harold S.; and Johnston, Burdith W., 4,543,800, Cl. 62-339.000.
Jolley, Michael E.: *See*—
Wang, Chao-Huei J.; and Jolley, Michael E., 4,544,546, Cl. 424-7.100.
Jonas Brothers, Inc.: *See*—
Van Veen, Onno; and Knobloch, Dale B., 4,544,361, Cl. 434-296.000.
Jones, C. Andrew: *See*—
Sofranko, John A.; and Jones, C. Andrew, 4,544,784, Cl. 585-500.000.
Jones, Charles E.: *See*—
Downey, Gale D.; and Jones, Charles E., 4,544,494, Cl. 252-135.000.
Jones, Dale G.: *See*—
Elliott, Henry H.; Lepovitz, Lawrence R.; and Jones, Dale G., 4,544,379, Cl. 55-71.000.
Jones, John O., Jr.; and White, Charles, Jr. Vibrator for furniture. 4,544,867, Cl. 318-129.000.
Jones, Steven K.: *See*—
Bright, David E.; and Jones, Steven K., 4,544,841, Cl. 250-221.000.
Ju, Cho H. Power Machine. 4,543,841, Cl. 74-461.000.
Juguin, Bernard; and Miquel, Jean, to Institut Francais du Petrole. Process for producing premium gasoline by polymerizing C_4 cuts. 4,544,791, Cl. 585-517.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brustle, Klaus, 4,543,686, Cl. 16-288.000.
Junginger, Klaus M.: *See*—
Grunikiewicz, Peter; Gommel, Karl; and Junginger, Klaus M., 4,543,720, Cl. 30-272.00R.
Juvin, Didier; and Dupeyrat, Benoit, to Commissariat a l'Energie Atomique. Process for automatic image recognition. 4,545,067, Cl. 382-21.000.
Kaack, Hermann: *See*—
Baumann, Hans; and Kaack, Hermann, 4,544,738, Cl. 534-617.000.

Kabushiki Kaisha: *See*—
Ito, Toshiyo; and Ohshima, Jiro, 4,543,707, Cl. 29-578.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Mikami, Yoshiharu, 4,544,042, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.
Yamada, Kaneo; Okamoto, Shigemi; and Asada, Kazuhiko, 4,544,514, Cl. 261-153.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Kitazawa, Yasuhide, 4,543,870, Cl. 84-96.000.
Kabushiki Kaisha T AN T: *See*—
Takano, Tsunesuke, 4,544,907, Cl. 337-262.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,544,871, Cl. 318-568.000.
Kabushiki Kaisha Toshiba: *See*—
Matsutani, Kinya; and Sasaki, Katutoki, 4,543,794, Cl. 62-54.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Seiki, Kazuo; Suzuki, Yoshihisa; and Yasui, Yoshiharu, 4,543,776, Cl. 57-261.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kataoka, Masao; Oshima, Yujiro; Noda, Takashi; and Suzuki, Shigeo, 4,543,929, Cl. 123-263.000.
Kaczkos, John E.: *See*—
Koppensteiner, James V.; and Kaczkos, John E., 4,544,066, Cl. 211-41.000.
Kade, Alexander; and Radomski, Thomas A., to General Motors Corporation. Bridge driver circuit for a DC electric motor. 4,545,004, Cl. 363-63.000.
Kadija, Igor V., to Olin Corporation. Porous diaphragms for electrolytic cells having non-uniform hydrophobicity. 4,544,474, Cl. 204-295.000.
Kadowaki, Hironori: *See*—
Wada, Takeshi; Kita, Hisanao; Wada, Tatsuji; Fujishima, Susumu; and Kadowaki, Hironori, 4,543,711, Cl. 29-726.000.
Kajiwara, Toshiro: *See*—
Yamazaki, Hiroyoshi; Minagawa, Yoshiji; Tsuchihashi, Michihiro; Anzai, Yoshinori; and Kajiwara, Toshiro, 4,544,862, Cl. 315-209.00R.
Kakizaki, Takao: *See*—
Kogure, Kenji; Kakizaki, Takao; Mitsuya, Yasunaga; Oguchi, Shigemitsu; and Otani, Koji, 4,544,972, Cl. 360-105.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Eibofner, Eugen; and Strohmaier, Ernst, 4,544,355, Cl. 433-104.000.
Kaltz, Milton C.; and Alexander, Michael P., to ASC Incorporated. Retractable backlight apparatus for vehicles. 4,543,747, Cl. 49-249.000.
Kamata, Kazuo: *See*—
Maemori, Takashi; and Kamata, Kazuo, 4,544,249, Cl. 354-195.120.
Kamieniecki, Emil, to GTE Laboratories Incorporated. Method of measuring photo-induced voltage at the surface of semiconductor materials. 4,544,887, Cl. 324-158.00R.
Kamimaru, Nobuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Programmable counter system. 4,545,063, Cl. 377-52.000.
Kaminaga, Hiromitsu; and Kondo, Hiroshi, to Yoshida Kogyo K. K. Heat-insulating frame assembly for use in corner of curtain wall construction. 4,543,756, Cl. 52-284.000.
Kaminsky, Walter; and Hahnsen, Heinrich, to Hoechst Aktiengesellschaft. Process for the preparation of oligomeric aluminoxanes. 4,544,762, Cl. 556-179.000.
Kammerer, Walter; and Spiro, Vladimir, to U.S. Philips Corporation. Private branch exchange having transmission channels commonly available to all stations. 4,545,049, Cl. 370-16.000.
Kampf, Hans: *See*—
Ingelmann, Hans-Joachim; and Kampf, Hans, 4,543,802, Cl. 62-525.000.
Kanaoka, Takeshi; and Shimizu, Shigehisa, to Fuji Photo Film Co., Ltd. Side printing apparatus. 4,544,259, Cl. 355-1.000.
Kando, Toru: *See*—
Haraguchi, Keisuke; and Kando, Toru, 4,544,251, Cl. 354-288.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Tsuge, Kazunori; Tawada, Yoshihisa; and Hamakawa, Yoshihiro, 4,544,423, Cl. 148-174.000.
Kaneko, Katuaki: *See*—
Take, Takao; Kaneko, Katuaki; and Otozaki, Sigeo, 4,544,424, Cl. 156-39.000.
Kaneko, Shinji: *See*—
Ishida, Kunio; and Kaneko, Shinji, 4,544,144, Cl. 267-64.150.
Kanemitsu, Shinji; and Tohyama, Yoshikuni, to Canon Kabushiki Kaisha. Transfer station alignment device. 4,544,262, Cl. 355-3.0TR.
Kaneno, Masayuki, to NGK Insulators, Ltd. Engine parts. 4,544,607, Cl. 428-472.000.
Kano, Hiroshi: *See*—
Nagata, Muneyoshi; and Kano, Hiroshi, 4,544,291, Cl. 400-208.000.
Kantor, Sherwood: *See*—
Bassetti, Larry W.; and Kantor, Sherwood, 4,544,264, Cl. 355-14.00R.
Kao Corporation: *See*—
Suzuki, Toshio, 4,544,498, Cl. 252-547.000.
Karacsonyi nee Eva Spindler, Belane ; Racz, Bela; Boszormenyi, Istvan; Kiraly, Laszlo ; and Medgyesi, Andras. Process for the production of an aqueous bituminous preparation. 4,544,410, Cl. 106-278.000.
Karasawa, Kazuo, to Nissan Motor Co., Ltd. Breather for electrical apparatus. 4,544,166, Cl. 277-57.000.
Karjalainen, Arto J.; and Kurkela, Kauko O. A., to Farmos Group, Ltd. Antihypertensive substituted imidazole derivatives. 4,544,664, Cl. 514-396.000.
Karl Becker GmbH & Co. KG: *See*—
Becker, Reinhard, 4,544,082, Cl. 221-200.000.
Karrer, Fritz. Method of liquid treatment of textile fiber material. 4,543,676, Cl. 8-149.100.
Karwacki, Francis A., to United States of America, Navy. Nuclear magnetic resonance gyroscope. 4,544,891, Cl. 324-304.000.
Kasahara, Yasushi: *See*—
Soma, Kazunori; and Kasahara, Yasushi, 4,544,640, Cl. 436-506.000.
Kasei Optonix, Ltd.: *See*—
Miyazaki, Tomohiro; Tanaka, Hitoshi; Matsumoto, Goro; Matsuhisa, Noboru; and Omatoi, Susumu, 4,544,605, Cl. 428-404.000.
Kaser, Peter: *See*—
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, 4,544,524, Cl. 419-9.000.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,543,685, Cl. 16-35.00R.
Kassai, Kenzou, to Kassai Kabushikikaisha. Caster. 4,543,685, Cl. 16-35.00R.
Kaszeta, William J.: *See*—
Bailey, William L.; and Kaszeta, William J., 4,544,876, Cl. 323-282.000.
Kataoka, Masao; Oshima, Yujiro; Noda, Takashi; and Suzuki, Shigeo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Turbulence generating method and internal combustion engine for carrying out the same. 4,543,929, Cl. 123-263.000.
Katayama, Hiroyuki: *See*—
Ohta, Kenji; Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,544,443, Cl. 156-643.000.
Katayama, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Select return mechanism in a manual transmission for automotive vehicles. 4,543,842, Cl. 74-473.00P.
Kato, Kiminari, to NGK Insulators, Ltd. Ceramic rotor and manufacturing process therefor. 4,544,327, Cl. 416-241.00B.
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for processing binary data. 4,544,962, Cl. 360-40.000.
Katsuhara, Yutaka: *See*—
Sawai, Mithio; Tasaka, Yoshihiro; Kawai, Toshikazu; and Katsuhara, Yutaka, 4,544,772, Cl. 568-411.000.
Katsuura, Nobuo, to Nikko Kogyo Kabushiki Kaisha. Cable holder. 4,544,800, Cl. 174-65.0SS.
Katz, Robert F. Combination toy and garment. 4,543,669, Cl. 2-84.000.
Kaufman, Alexander A.; and McNeill, James D., to Geonics Limited. Signal processing apparatus for frequency domain geophysical electromagnetic surveying system. 4,544,892, Cl. 324-334.000.
Kaul, Bansi L., to Sandoz Ltd. 1,4-Di-[2'-(2'',4''-dichlorophenylazo)-3'-oxobutyramido]-2-methoxybenzene. 4,544,736, Cl. 534-575.000.
Kausch, William L., to Minnesota Mining and Manufacturing Company. Negative-acting photoresist imaging system. 4,544,622, Cl. 430-278.000.
Kavli, Tom O.: *See*—
Park, Kyong; and Kavli, Tom O., 4,544,875, Cl. 323-280.000.
Kavlico Corporation: *See*—
Park, Kyong; and Kavli, Tom O., 4,544,875, Cl. 323-280.000.
Kawai, Toshikazu: *See*—
Sawai, Mithio; Tasaka, Yoshihiro; Kawai, Toshikazu; and Katsuhara, Yutaka, 4,544,772, Cl. 568-411.000.
Kawamura, Kenji: *See*—
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,544,984, Cl. 361-119.000.
Kawamura, Kichinari: *See*—
Okado, Hideo; Hashimoto, Kazuo; Kawamura, Kichinari; Yamazaki, Yasuyoshi; and Takaya, Haruo, 4,544,793, Cl. 585-640.000.
Kawana, Takeshi: *See*—
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.
Kawanami, Hisashi; Suzuki, Kiyoshi; and Kawauchi, Akihiro, to Toshiba Electric Equipment Corporation. Marker light. 4,544,999, Cl. 362-298.000.
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, to Hirose Electric Co., Ltd.; and Mito Teck Co., Ltd. Coaxial lightning arresting structure. 4,544,984, Cl. 361-119.000.
Kawano, Hitoshi: *See*—
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photo-electric conversion device with accumulation time control and leakage current compensation. 4,544,848, Cl. 250-578.000.
Kawasaki Steel Corporation: *See*—
Irie, Toshio; Sato, Susumu; and Hashimoto, Osamu, 4,544,419, Cl. 148-12.00C.
Yoshida, Shigeru; Shiraishi, Norihisa; Asakawa, Chosei; and Sakaguchi, Morohira, 4,544,142, Cl. 266-252.000.
Kawashima, Susumu; and Yamada, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument producing chord tones utilizing channel assignment. 4,543,869, Cl. 84-1.010.

Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Self-emulsifying sizing composition. 4,544,414, Cl. 106-287.240.

Kawauchi, Akihiro: *See*—
Kawanami, Hisashi; Suzuki, Kiyoshi; and Kawauchi, Akihiro, 4,544,999, Cl. 362-298.000.

Kayama, Hiroaki: *See*—
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,543,849, Cl. 74-501.50R.

Kazi, Shaukat A.: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat A., 4,544,128, Cl. 251-30.010.

Kearney, Dolores C.; Giza, Peter; and Matz, Bruno, to Ford Motor Company. Method of reclaiming sand used in evaporative casting process. 4,544,013, Cl. 164-5.000.

Kearns, Robert W.; and Kearns, Timothy B., to Kearns, Robert W. Intermittant windshield wiper control system with improved motor speed control. 4,544,870, Cl. 318-444.000.

Kearns, Timothy B.: *See*—
Kearns, Robert W.; and Kearns, Timothy B., 4,544,870, Cl. 318-444.000.

Keaton, Tanya L. Semiautomatically actuated rotable lounge chair. 4,544,202, Cl. 297-349.000.

Keeton Enterprises: *See*—
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,543,743, Cl. 47-1.500.

Keeton, Eugene G.: *See*—
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,543,743, Cl. 47-1.500.

Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., to Keeton Enterprises. Herbicide applicator. 4,543,743, Cl. 47-1.500.

Keeton, Lyle S.: *See*—
Keeton, John H.; Keeton, Lyle S.; and Keeton, Eugene G., 4,543,743, Cl. 47-1.500.

Keggins, Kathleen M.; Davis, Ann C.; Sybert, Edward M.; Mays, Thomas D.; and Milch, Robert A., to IGI Biotechnology, Inc. Culture media from clarified diary whey lactose permeates. 4,544,637, Cl. 435-253.000.

Keiper Automobiltechnik GmbH & Co. KG: *See*—
Schmale, Gerhard, 4,544,204, Cl. 297-452.000.

Keller, Christian A., to Johns Hopkins University, The. Fiber optic fluid impurity detector. 4,544,840, Cl. 250-227.000.

Keller, Richard A.: *See*—
Cremers, David A.; and Keller, Richard A., 4,544,274, Cl. 356-436.000.

Kellermyer, David S. Self-storing LPG tank cart. 4,544,173, Cl. 280-47.330.

Kellett, Roger N.; and Hicks, Clayton J. Bar joist supported suspension clips. 4,544,119, Cl. 248-58.000.

Kelley, Max D., to Chevron Research Company. Process for pyrolyzing hydrocarbonaceous solids to recover volatile hydrocarbons. 4,544,478, Cl. 208-11.00R.

Kellogg, Guy, to United Steel & Wire Company. Anti-sway clip for rear gate of shopping cart basket. 4,544,171, Cl. 280-33.99A.

Kelly, Donald H.: *See*—
Crane, Hewitt D.; and Kelly, Donald H., 4,544,246, Cl. 351-211.000.

Kelso, Kenneth S.: *See*—
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.

Kemner, Axel: *See*—
Bachmann, Wilhelm; and Kemner, Axel, 4,543,975, Cl. 137-85.000.

Kenhar Products Incorporated: *See*—
Hornung, Steve, 4,544,324, Cl. 414-785.000.

Keogh, Michael J., to Union Carbide Corporation. Reaction products of a difunctional compound and an organo titanate. 4,544,760, Cl. 556-40.000.

Kermisch, Dorian, to Xerox Corporation. Rotation of digital images. 4,545,069, Cl. 382-46.000.

Kern, George M., to Silberline Manufacturing Company, Inc. Resin compositions containing metals such as aluminum. 4,544,600, Cl. 428-323.000.

Kern, Mark T.; Bell, Robert A.; and Riedl, Max J., to Santa Barbara Research Center. Radiation detector with built-in test capability. 4,544,843, Cl. 250-239.000.

Kernforschungsanlage Julich, Gesellschaft mit Beschrankter Haftung: *See*—
Struck, Bernd-Dieter; Biallas, Bernd; and Schulten, Rudolf, 4,544,459, Cl. 204-103.000.

Kernforschungsanlage Julich GmbH: *See*—
Mallek, Heinz; Laser, Manfred; and Ermisch, Dorothee, 4,544,374, Cl. 48-114.000.

Kessler, Jochem; and Heinrich, Bernd, to Ing. h.c.F. Porsche AG. Circuit arrangement for the actuation of the throttle valve of a motor vehicle internal combustion engine. 4,543,933, Cl. 123-361.000.

Kessler, Peter-Jurgen; Mayer, Jurgen; and Weiler, Paul, to Robert Bosch GmbH. Windshield wiper device for motor vehicles. 4,543,682, Cl. 15-250.420.

Keyasko, Mark. Lightweight, rigid, metal product and process for producing same. 4,543,803, Cl. 63-2.000.

Keys, Richard H., Jr. Patient's mouthpiece. 4,543,950, Cl. 128-136.000.

Khandwala, Bhupendra J.: *See*—
Young, Jorge A.; and Khandwala, Bhupendra J., 4,544,832, Cl. 235-377.000.

Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, to Syra Company. Chloramphenicol derivatives. 4,544,765, Cl. 560-29.000.

Kidode, Masatsugu: *See*—
Tabata, Mitsuo; Kidode, Masatsugu; and Yamaguchi, Noboru, 4,545,068, Cl. 382-41.000.

Kiederle, Richard: *See*—
Zerhoch, Georg; Sauter, Josef; Kiederle, Richard; and von Stein, Gunther, 4,543,739, Cl. 38-15.000.

Kieffer, Jean: *See*—
Henry, Georges; and Kieffer, Jean, 4,543,712, Cl. 29-825.000.

Kierstead, Richard W.: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.

Kieser, Manfred: *See*—
Franz, Klaus-Dieter; Kieser, Manfred; and Stahlecker, Otto, 4,544,415, Cl. 106-288.00R.

Kihara, Nobuyoshi: *See*—
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, 4,544,962, Cl. 360-40.000.

Kijima, Yasuhiko: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,544,511, Cl. 260-549.000.

Kikuchi, Hiroshi; and Sato, Kenji, to Oki Electric Industry Co., Ltd. Shuttle type line printer. 4,543,884, Cl. 101-93.040.

Kilmonis, Peter P. Apparatus for carrying and playing games. 4,544,158, Cl. 273-150.000.

Kim, Yong C.: *See*—
Dietiker, Paul; Kim, Yong C.; Nelson, Marvin D.; and Olson, Elwyn H., 4,543,974, Cl. 137-66.000.

Kimoto, Toshifumi: *See*—
Itami, Teruhiko; Kimoto, Toshifumi; Yamasawa, Akira; and Saitoh, Koichi, 4,544,574, Cl. 427-48.000.

Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, to Institut For Energetik Zentralstelle Fur Rationelle Energieanwendung. Process for manufacturing hydrophobic adsorbents. 4,544,650, Cl. 502-424.000.

King, David A.: *See*—
Dunn, Philip; and King, David A., 4,544,200, Cl. 297-265.000.

King, Francis D.: *See*—
Hadley, Michael S.; and King, Francis D., 4,544,660, Cl. 514-329.000.

King, George W., to Stackpole Limited. Roll fed labelling machine. 4,544,431, Cl. 156-256.000.

King, James L., to General Electric Company. Dynamoelectric machine and stator. 4,544,856, Cl. 310-71.000.

Kioritz Corporation: *See*—
Nagashima, Akira; and Taomo, Toshio, 4,543,915, Cl. 123-41.650.

Kiraly, Laszlo : *See*—
Karacsonyi nee Eva Spindler, Belane ; Racz, Bela; Boszormenyi, Istvan; Kiraly, Laszlo ; and Medgyesi, Andras, 4,544,410, Cl. 106-278.000.

Kirby, John: *See*—
Jarvis, William A.; Kirby, John; Lane, Alan J.; Pokorski, John P.; and Sheffield, Wilbur L., 4,544,296, Cl. 401-73.000.

Kiriake, Masaharu: *See*—
Matsui, Isamu; Yamamoto, Yoshio; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimamoto, Akira, 4,544,107, Cl. 242-35.50A.

Kirk, Johnie C. Floor illuminating bedside light unit. 4,544,993, Cl. 362-153.000.

Kirker, Timothy J., to Rolls-Royce Limited. Exhaust flow mixers and nozzles. 4,543,784, Cl. 60-262.000.

Kirkland, Lester: *See*—
Milne, Robin I.; and Kirkland, Lester, 4,544,808, Cl. 179-99.0LS.

Kishimoto, Masayuki. Pressure accumulator. 4,543,997, Cl. 138-30.000.

Kishimoto, Tadamitsu: *See*—
Yamamura, Yuichi; and Kishimoto, Tadamitsu, 4,544,632, Cl. 435-68.000.

Kita Electrics Co., Ltd.: *See*—
Kobayashi, Nobuki, 4,545,031, Cl. 364-900.000.

Kita, Hisanao: *See*—
Wada, Takeshi; Kita, Hisanao; Wada, Tatsuji; Fujishima, Susumu; and Kadowaki, Hironori, 4,543,711, Cl. 29-726.000.

Kitada, Masahiro: *See*—
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.

Kitajima, Tadayuki; Hayakawa, Kimiaki; Ueda, Noriyoshi; and Hiroi, Masakazu, to Canon Kabushiki Kaisha. Automatic original conveying device. 4,544,148, Cl. 271-3.100.

Kitazawa, Yasuhide, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Drum for music box. 4,543,870, Cl. 84-96.000.

Kitchin, David A., to John Hopkins University, The; and Intec Systems, Inc. Synchronous clock stopper for microprocessor. 4,545,030, Cl. 364-900.000.

Klaassen, Alan W.; and Bezman, Richard D., to Chevron Research Company. Promoter for the oxidation of SO_2 in an FCC process. 4,544,645, Cl. 502-66.000.

Klatt, Alfred, to WABCO Fahrzeugbremsen GmbH. Power operated, remotely controlled transmission. 4,543,856, Cl. 74-866.000.

Klaus, Thomas R.: *See*—
Skutta, Frank R.; and Klaus, Thomas R., 4,545,072, Cl. 455-183.000.

Kleinberg, Larry K.; and Evans, Don S., to Urban Engineering Co., Inc. Surgical instrument and method of making same. 4,543,857, Cl. 76-101.00R.

Kliewer, Wayne R.: *See*—
Lemanski, Michael F.; and Kliewer, Wayne R., 4,544,673, Cl. 518-713.000.
Klioze, Solomon S., to Hoechst-Roussel Pharmaceuticals Inc. Cis-4a-aryl, 1, 2, 3, 4, 4A, 9B-hexahydro-benzofuro-[3,2-C]- pyridines useful as analgesics. 4,544,745, Cl. 546-89.000.
Klockner-Werke Aktiengesellschaft: *See*—
Berstermann, Wilhelm; Grisar, Ulrich; and Koerfer, Egon, 4,544,270, Cl. 356-313.000.
Kloosterhof, Leonardus P. A.: *See*—
Elkerbout, Marten F.; and Kloosterhof, Leonardus P. A., 4,544,278, Cl. 366-129.000.
Klostermann, Heinrich F., to Litton Systems, Inc. X-ray tube rotor mounting. 4,545,064, Cl. 378-132.000.
KMW ERJO AB: *See*—
Carlsson, Jan E. K., 4,544,104, Cl. 241-57.000.
Carlsson, Jan E. K., 4,544,105, Cl. 241-73.000.
Knee, William R.; and Cutie , Sergio S., to Dow Chemical Company, The. Reduction of acrylamide and acrylonitrile emissions. 4,544,768, Cl. 564-206.000.
Knipp, Jerry L.: *See*—
Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., 4,544,218, Cl. 339-31.00L.
Knob, Kevin J.: *See*—
Chao, Paul K.; Knob, Kevin J.; and Yurchak, Sergei, 4,544,781, Cl. 585-408.000.
Knobloch, Dale B.: *See*—
Van Veen, Onno; and Knobloch, Dale B., 4,544,361, Cl. 434-296.000.
Knutsson, Lars G., to Ingenjorsfirma G. Knutsson AB. Equipment for handling sheet material in a pattern cutting machine. 4,544,824, Cl. 219-121.0LG.
Ko-Operatiewe Wijnbouers Vereniging Van Zuid-Afrika Beperkt: *See*—
Sanderson, Ronald D.; and Badenhorst, Jurchens B., 4,544,589, Cl. 428-35.000.
Kobayashi, Hiroshi; Machida, Hazime; and Tanaka, Motoharu, to Ricoh Company, Ltd. Magneto-optical recording medium having a ferrimagnetic recording layer. 4,544,602, Cl. 428-336.000.
Kobayashi, Masaaki: *See*—
Nishiguchi, Yuzuru; Uchiyama, Shigeru; and Kobayashi, Masaaki, 4,544,858, Cl. 310-321.000.
Kobayashi, Nobuki, to Kita Electrics Co., Ltd. Photo-electric apparatus for monitoring printed papers. 4,545,031, Cl. 364-900.000.
Kobayashi, Ryohei: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,544,406, Cl. 75-123.00N.
Kobayashi, Yukio: *See*—
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,544,615, Cl. 429-194.000.
Koch, Hannsjorg: *See*—
Metschl, Michael; and Koch, Hannsjorg, 4,544,384, Cl. 55-180.000.
Kochi, Hiromu: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,544,653, Cl. 514-202.000.
Koczka, Istvan: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Kodama, Hideyo; Kondo, Yasuo; and Akahori, Kimihiko, to Hitachi, Ltd. Method and apparatus for manufacturing composite steel ingot. 4,544,019, Cl. 164-496.000.
Koella, Ernest, III; and Harmon, Albert D. Textile spindle assembly and method. 4,543,778, Cl. 57-303.000.
Koelmel, Donald F.: *See*—
Shalaby, Shalaby W.; and Koelmel, Donald F., 4,543,952, Cl. 128-335.500.
Koenig, Horst: *See*—
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.
Koerfer, Egon: *See*—
Berstermann, Wilhelm; Grisar, Ulrich; and Koerfer, Egon, 4,544,270, Cl. 356-313.000.
Kogure, Kenji; Kakizaki, Takao; Mitsuya, Yasunaga; Oguchi, Shigemitsu; and Otani, Koji, to Nippon Telegraph & Telephone Public Corporation. Swinging actuators for use in magnetic disc type memory devices. 4,544,972, Cl. 360-105.000.
Kohjin Co., Ltd.: *See*—
Oka, Hiroshi, 4,544,391, Cl. 62-541.000.
Kohle, Ulrich; and Paffhausen, Hans, to Pelikan AG. Multistrike ribbon. 4,544,292, Cl. 400-241.200.
Kohler, Rolf-Dieter: *See*—
Hagen, Helmut; and Kohler, Rolf-Dieter, 4,544,755, Cl. 548-335.000.
Koike, Kazumi: *See*—
Aoki, Fujio; and Koike, Kazumi, 4,544,097, Cl. 239-126.000.
Koishi, Kenji: *See*—
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,545,044, Cl. 369-32.000.
Kojima, Ichiro; Komiya, Kouji; Sato, Hiroshi; and Oguchi, Yutaka, to Nippon Oil Company, Ltd. Process for producing vitamin B_{12} by the fermentation technique, and vitamin B_{12}-producing microorganism. 4,544,633, Cl. 435-86.000.
Kojima, Seiji: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,544,233, Cl. 350-96.200.
Kolb, Gustav: *See*—
Tenberg, Werner; and Kolb, Gustav, 4,544,140, Cl. 266-99.000.
Kolbe, James R., to Xerox Corporation. Removable processing cartridge for electrostatographic reproducing apparatus. 4,544,260, Cl. 355-3.0BE.
Kolchinsky, Abel E.; and Kazi, Shaukat A., to Imperial Clevite Inc. Cartridge solenoid valve with manual override. 4,544,128, Cl. 251-30.010.
Kollmorgen Technologies Corporation: *See*—
Lassen, Charles L., 4,544,442, Cl. 156-643.000.
Komatsu, Hiroshi: *See*—
Nishiguchi, Fumio; and Komatsu, Hiroshi, 4,544,326, Cl. 415-151.000.
Komiya, Hidetsugu; and Hattori, Seiichi, to Fanuc Ltd. Memory cassette holding apparatus. 4,544,971, Cl. 360-96.500.
Komiya, Kouji: *See*—
Kojima, Ichiro; Komiya, Kouji; Sato, Hiroshi; and Oguchi, Yutaka, 4,544,633, Cl. 435-86.000.
Komiyama, Choji: *See*—
Oishi, Kengo; Komiyama, Choji; and Suzuki, Osamu, 4,544,976, Cl. 360-132.000.
Komukai, Chogo, to Hachinohe Kanzume Co., Ltd. Method of manufacturing food resembling scallop and food resembling scallop obtained by the same method. 4,544,561, Cl. 426-104.000.
Komura, Seiichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Support apparatus for medical appliance. 4,544,121, Cl. 248-331.000.
Kondo, Hiroshi: *See*—
Kaminaga, Hiromitsu; and Kondo, Hiroshi, 4,543,756, Cl. 52-284.000.
Kondo, Takao: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,544,511, Cl. 260-549.000.
Kondo, Yasuo: *See*—
Kodama, Hideyo; Kondo, Yasuo; and Akahori, Kimihiko, 4,544,019, Cl. 164-496.000.
Konishi, Masahiro, to Fuji Photo Film Co., Ltd. Electronic still camera. 4,544,960, Cl. 360-35.100.
Konuma, Hiroshi: *See*—
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,544,615, Cl. 429-194.000.
Kopko, John J., to Xerox Corporation. Development process utilizing conductive materials. 4,544,618, Cl. 430-102.000.
Koppensteiner, James V.; and Kaczkos, John E., to GTE Communication Systems Corporation. Printed wiring board file employing wire structural members. 4,544,066, Cl. 211-41.000.
Kordosky, Gary A.; Sudderth, R. Brantley; Sierakoski, J. Michael; and MacKay, Kenneth D., to Henkel Corporation. Solvent extraction. 4,544,532, Cl. 423-24.000.
Kosonocky, Walter F.; and Elabd, Hammam, to RCA Corporation. Schottky-barrier diode radiant energy detector with extended longer wavelength response. 4,544,939, Cl. 357-30.000.
Kotani, Sho: *See*—
Adachi, Shichiro; and Kotani, Sho, 4,544,829, Cl. 219-237.000.
Kotting, Fritz, to Wernicke & Co. GmbH. Device for centering spectacle lenses and for fastening a holding part on the lenses. 4,543,752, Cl. 51-277.000.
Koudijs, George P.: *See*—
Angevine, Peter A.; Bengtsson, Sune; and Koudijs, George P., 4,544,542, Cl. 423-555.000.
Kowalski, Robert J. Archery bow sight. 4,543,728, Cl. 33-265.000.
Koyama, Katsuhiko: *See*—
Ohno, Yoshio; Koyama, Katsuhiko; and Nishio, Kohsaku, 4,544,247, Cl. 352-62.000.
Kozikowski, Casimir P. Standing poles and method of repair thereof. 4,543,764, Cl. 52-746.000.
Kozuki, Susumu; and Takayama, Makoto, to Canon Kabushiki Kaisha. Video recording system. 4,544,959, Cl. 360-33.100.
Krah, Albrecht: *See*—
Hartmann, Rolf; Krah, Albrecht; Egle, Hilda; and Ziegler, Rudolf, 4,544,441, Cl. 156-634.000.
Kramer, Donald J. Dock connector and stabilizer. 4,543,903, Cl. 114-263.000.
Kramski GmbH Prazisionswerkzeuge-Metallwaren: *See*—
Kramski, Wiestaw, 4,543,865, Cl. 83-146.000.
Kramski, Wiestaw, to Kramski GmbH Prazisionswerkzeuge-Metallwaren. Punch press tool for punching small holes in a strip of sheet metal, and obtaining small punched blanks. 4,543,865, Cl. 83-146.000.
Krause, Joachim: *See*—
Romer, Michael; Krause, Joachim; and Weber, Georg, 4,544,771, Cl. 568-329.000.
Krehbiel, Eldon W. Shearing apparatus. 4,544,366, Cl. 30-216.000.
Krenitsky, Thomas A., to Burroughs Wellcome Co. Method of producing acyclovir. 4,544,634, Cl. 435-119.000.
Kretchmar, Roy, to Certified Energy Systems, Inc. Rectifier housing for ule with light bulbs. 4,544,861, Cl. 315-200.00R.
Krill, Wayne V.; Wong, Thomas; and Gotterba, James, to Gas Research Institute. Segmented radiant burner assembly and combustion process. 4,543,940, Cl. 126-92.0AC.

Krocher, Harro, to Hombak Maschinenfabrik GmbH & Co. KG. Scratcher element for a wood-cutting tool. 4,544,009, Cl. 144-230.000.

Kroger, Harry, to Sperry Corporation. Formation of normal resistors by degenerate doping of substrates. 4,544,937, Cl. 357-5.000.

Kroll, Quin D.: *See—*
Olmsted, Daniel C.; and Kroll, Quin D., 4,543,979, Cl. 137-315.000.

Kronstadt, Victor, to Mack Trucks, Inc. Oil shut-off device for wet clutches. 4,544,055, Cl. 192-70.120.

Krstovic, Dragisa. Adjustable cutting or boring tool. 4,544,309, Cl. 408-157.000.

Krug, William: *See—*
Minten, Karl; and Krug, William, 4,544,707, Cl. 525-330.400.

Krull, Klaus: *See—*
Hauk, Waldemar; Krull, Klaus; and Welzenbach, Manfred, 4,545,048, Cl. 370-1.000.

Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., to PPG Industries, Inc. Method and apparatus for controlling currents in glass melter. 4,544,396, Cl. 65-178.000.

Kubo, Kanji: *See—*
Taniguchi, Hiroshi; Ohtsu, Masamitsu; and Kubo, Kanji, 4,544,966, Cl. 360-75.000.

Kucera, Gene H.; and Roche, Michael F., to United States of America, Energy. Glass electrolyte composition. 4,544,614, Cl. 429-193.000.

Kuivila, Charles S.: *See—*
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., 4,544,457, Cl. 204-67.000.

Kuklinski, Siegfried: *See—*
Gnadig, Gerhard; and Kuklinski, Siegfried, 4,544,341, Cl. 425-192.00R.

Kumada, Makoto: *See—*
Nate, Kazuo; Inoue, Takashi; Yokono, Hitoshi; Ishikawa, Mitsuo; and Kumada, Makoto, 4,544,729, Cl. 528-28.000.

Kummerl, Hermann. Conveying system for passing photographic layer-bearing carriers of strip or sheet form through the photo chemical baths of a developing apparatus. 4,544,253, Cl. 354-321.000.

Kunnecke, Manfred, to Didier-Werke AG. Lining brick. 4,543,893, Cl. 110-338.000.

Kurashiki Boseki Kabushiki Kaisha: *See—*
Muraki, Ryoji; Numata, Seiiti; and Hayashi, Kanji, 4,545,009, Cl. 364-164.000.

Kurek, Paul R.; Engel, Dusan J.; and Fergin, Richard L., to UOP Inc. Solvent extraction of aromatic compounds using alkylsulfoxide solvents. 4,544,796, Cl. 585-856.000.

Kurihara, Tetsuro, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray diagnostic apparatus and method. 4,544,949, Cl. 358-111.000.

Kurihara, Toshihiko: *See—*
Hirano, Hiroyuki; Kurihara, Toshihiko; Akiba, Taichi; and Araki, Yositsugu, 4,545,003, Cl. 369-43.000.

Kurimoto, Mamoru: *See—*
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,544,406, Cl. 75-123.00N.

Kurkela, Kauko O. A.: *See—*
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,544,664, Cl. 514-396.000.

Kurth, Gunter: *See—*
Walter, Kurt; Gokorsch, Wilfried; Kurth, Gunter; Grusdt, Rainer; and Schreiter, Manfred, 4,543,770, Cl. 53-511.000.

Kurth, Richard R.; and Gabel, Robert A., to Sperry Corporation. Wideband beamformer. 4,544,927, Cl. 343-373.000.

Kuth, Robert: *See—*
Heise, Klaus-Peter; Kuth, Robert; Neufang, Karl; Pantke, Hellmuth; and Wedemeyer, Karlfried, 4,544,372, Cl. 8-602.000.

Kuziemka, Edmund J., to Material Sciences Corporation. Polysiloxane and fluorocarbon coating composition. 4,544,692, Cl. 524-361.000.

Kuznicki, Steven M.: *See—*
Coe, Charles G.; and Kuznicki, Steven M., 4,544,378, Cl. 55-68.000.

Kvaternik, Joseph. Miniature circuit processing devices and matrix test heads for use therein. 4,544,888. Cl. 324-158.00P.

Kvistad, Garry M. Percussion bar instrument. 4,543,871, Cl. 84-403.000.

Kwech, Horst; and Olson, Peter K., to E. H. Wachs Company, The. Portable lathe. 4,543,861, Cl. 82-4.00C.

Kwek, Seng H.: *See—*
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.

Kwon, Ki C.; and Luther, Thomas A., to Warner & Swasey Company, The. Recirculating bearing assembly and method of making. 4,544,211, Cl. 308-6.00C.

Kyokuto Fatty-Acid Corporation: *See—*
Itoh, Shuji; and Hayashi, Koichi, 4,544,436, Cl. 156-549.000.

Kysor Industrial Corporation: *See—*
Ward, David R.; and Zieske, William E., 4,543,795, Cl. 62-158.000.

Labbe, Francis A. M., to Molins PLC. Cigarette manufacture. 4,543,967, Cl. 131-84.300.

Labombarde, Raymond A. Case presenter apparatus and method. 4,544,368, Cl. 493-27.000.

Labor Muszeripari Muvek: *See—*
Szabo, Zsolt, 4,544,127, Cl. 251-9.000.

LaBudde, Edward V.; and Niven, Jeffrey E., to Burroughs Corporation. Mirror position sensor and associated motor for improved track selection in optical data disk system. 4,544,241, Cl. 350-486.000.

Ladish, Douglas J., to Reichhold Chemicals, Incorporated. Aqueous rubberized coal tar emulsion. 4,544,690, Cl. 524-60.000.

Lagakos, Nicholas: *See—*
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,544,499, Cl. 252-629.000.

LaHann, Thomas R.; Janusz, John M.; and Buckwalter, Brian L., to Procter & Gamble Company, The. Compounds and compositions useful for producing analgesia. 4,544,669, Cl. 514-563.000.

LaHann, Thomas R.: *See—*
Janusz, John M.; Buckwalter, Brian L.; and LaHann, Thomas R., 4,544,668, Cl. 514-563.000.

Lake, Ralph J., Jr.; Steckowich, John, Jr.; and Solomon, Stephen R., to Burroughs Corporation. Keyboard assembly. 4,544,301, Cl. 403-300.000.

Lambert, Pierre M.; and De Aguirre-Otegui, Ignacio, to Societe Carbochimique. Salts of 1,3,5-oxadiazines-2,4,6-triones, 1,3,5-oxadiazines-2,4,6-triones and the preparation thereof. 4,544,743, Cl. 544-64.000.

Lamm, Bo R.: *See—*
Brandstrom, Arne E.; and Lamm, Bo R., 4,544,750, Cl. 546-290.000.

Lammel, Gunter: *See—*
Nagel, Erich; Huber, Leonhard; and Lammel, Gunter, 4,544,110, Cl. 242-67.10R.

Land, Ronny L.: *See—*
Dunn, Jimmy L.; Gilstrap, Lonnie D.; Land, Ronny L.; and Romeo, Frank C., 4,544,193, Cl. 294-86.400.

Lane, Alan J.: *See—*
Jarvis, William A.; Kirby, John; Lane, Alan J.; Pokorski, John P.; and Sheffield, Wilbur L., 4,544,296, Cl. 401-73.000.

Lane, Bennie L. Rail and cap strip for securing rubber roof membrane to a deck without fastener penetrations. 4,543,758, Cl. 52-410.000.

Lang, Thomas P. Apparatus for bending thin-walled pipes. 4,543,809, Cl. 72-150.000.

Lange, Alois: *See—*
Goldberg, Gerhard; and Lange, Alois, 4,544,027, Cl. 165-95.000.

Langner, Gunther O.; Pfeiffer, Hans C.; and Sturans, Maris A., to International Business Machines Corporation. Variable axis immersion lens electron beam projection system. 4,544,846, Cl. 250-396.0ML.

Lanham Machinery Company, Inc.: *See—*
Lanham, William E.; and Smith, Stephen R., 4,544,352, Cl. 432-133.000.

Lanham, William E.; and Smith, Stephen R., to Lanham Machinery Company, Inc. Baking oven with heated air distribution. 4,544,352, Cl. 432-133.000.

Lanier, John. Apparatus for moving a wheelchair into and out of an automobile. 4,544,321, Cl. 414-542.000.

Lansdown, Anthony R., to University College of Swansea, The. Use of a hydraulic squeeze film to lubricate the strand in continuous casting. 4,544,017, Cl. 164-472.000.

Lapeyre, James M. Internal combustion engine. 4,543,917, Cl. 123-51.00B.

Larigaldie, Serge: *See—*
Taillet, Joseph; and Larigaldie, Serge, 4,544,382, Cl. 55-107.000.

Laser, Manfred: *See—*
Mallek, Heinz; Laser, Manfred; and Ermisch, Dorothee, 4,544,374, Cl. 48-114.000.

Laser Precision Corporation: *See—*
Doyle, Walter M., 4,544,272, Cl. 356-346.000.

Lassen, Charles L., to Kollmorgen Technologies Corporation. Process for the manufacture of substrates to interconnect electronic components. 4,544,442, Cl. 156-643.000.

Lau, Buong P.: *See—*
Boots, Byron R.; and Lau, Buong P., 4,544,413, Cl. 106-287.140.

Laude, Jean-Pierre, to Instruments S.A. Coupling-extracting device for optical signal. 4,544,232, Cl. 350-96.150.

Lauer, Ernst H.: *See—*
Reynolds, Joseph D.; and Lauer, Ernst H., 4,543,843, Cl. 74-473.00R.

Lauer, Gerhard; Morawietz, Alfred; and Wild, Jurgen. Apparatus for ascertaining the positions of openings in bulky workpieces. 4,543,726, Cl. 33-180.00R.

Laverman, Royce J.; and Bertolazzi, Luciano F., to Chicago Bridge & Iron Company. Single tank for dual thermal energy storage with internal movable partition. 4,543,978, Cl. 137-255.000.

Law, David, to Development Finance Corporation of New Zealand. Tapered nesting hinge. 4,543,687, Cl. 16-388.000.

Lazzari, Jean-Pierre: *See—*
Jeuch, Pierre; Lazzari, Jean-Pierre; and Parrens, Pierre, 4,544,445, Cl. 156-643.000.

Lear Siegler, Inc.: *See—*
McKenney, John D., 4,543,905, Cl. 116-63.00P.

Leavitt, Richard P.: *See—*
Wortman, Donald E.; Morrison, Clyde A.; and Leavitt, Richard P., 4,545,056, Cl. 372-2.000.

Leccese, Antonio: *See—*
Mayr, Adolfe; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettoro, 4,544,717, Cl. 526-125.000.

Lechthaler, Jurg, to Nestec S. A. Process of preparing a gelled pasta product. 4,544,563, Cl. 426-276.000.

Lee, Chi-Long; and Rabe, James A., to Dow Corning Corporation. Foamable organosiloxane compositions. 4,544,681, Cl. 521-134.000.

Lee, David L., to Stauffer Chemical Company. Certain 1,3-cyclohexanedione adducts of substituted phenoxyphenoxypropionic acids and their use as an herbicide. 4,544,399, Cl. 71-88.000.

Lee, Nathan D.; and Sethi, Dalbir S., to FMC Corporation. Purification of alkylated anthraquinones. 4,544,543, Cl. 423-588.000.

Leeds & Northrup Company: *See—*
Collier, John E., 4,545,029, Cl. 364-900.000.

Leff, Kenneth J.: *See—*
Galvin, Aaron A.; Harvey, Roy L.; and Leff, Kenneth J., 4,544,836, Cl. 235-487.000.
Legrand, Pierre: *See—*
Roullet, Gilbert; and Legrand, Pierre, 4,544,698, Cl. 524-503.000.
Lehmann, Hans D.: *See—*
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.
Leippe, Michael M.: *See—*
Anderson, Richard J.; and Leippe, Michael M., 4,544,400, Cl. 71-90.000.
Leiss, John E.: *See—*
Chatterjee, Pallab; Shichijo, Hisashi; and Leiss, John E., 4,545,034, Cl. 365-182.000.
Lemanski, Michael F.; and Kliewer, Wayne R., to Standard Oil Company. Process for producing low molecular weight hydrocarbons from carbon monoxide and hydrogen. 4,544,673, Cl. 518-713.000.
Lemelson, Jerome H. Weighing apparatus and method. 4,544,929, Cl. 346-9.000.
Lenhoff, John G., Jr., to Westinghouse Electric Corp. A/D converter having digitally controlled subranging and self-alignment apparatus for use therein. 4,544,917, Cl. 340-347.0AD.
Lenke, Dieter: *See—*
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.
Lennox Industries, Inc.: *See—*
Ellis, Charles B., 4,544,334, Cl. 417-360.000.
Lenz, Herman N.: *See—*
Rogo, Casimir; and Lenz, Herman N., 4,544,325, Cl. 415-150.000.
Le Page, Jean-Francois: *See—*
Dang Vu, Quang; Pradel, Claude; Euzen, Jean-Paul; and Le Page, Jean-Francois, 4,544,544, Cl. 423-659.000.
Lepovitz, Lawrence R.: *See—*
Elliott, Henry H.; Lepovitz, Lawrence R.; and Jones, Dale G., 4,544,379, Cl. 55-71.000.
Lerch, Reinhard, to Siemens AG. Ultrasonic imaging system. 4,543,828, Cl. 73-626.000.
Lerch, Reinhard, to Siemens AG. Ultrasonic imaging system. 4,543,829, Cl. 73-626.000.
Lerner, Richard A.: *See—*
Bittle, James L.; and Lerner, Richard A., 4,544,500, Cl. 260-112.50R.
Lessard, William W.: *See—*
Levene, Martin M.; and Lessard, William W., 4,543,862, Cl. 83-19.000.
Leterrier, Guy: *See—*
Drabowitch, Serge; and Leterrier, Guy, 4,544,925, Cl. 343-18.00E.
Letraset Limited: *See—*
Shepherd, John V., 4,544,430, Cl. 156-235.000.
Leutz, Walter: *See—*
Peterseim, Heinz; and Leutz, Walter, 4,544,138, Cl. 266-44.000.
Levene, Martin M.; and Lessard, William W., to Ontario Die Company Limited. Vacuum die cutting apparatus for foam backed materials. 4,543,862, Cl. 83-19.000.
Levin, Robert E.: *See—*
English, George J.; and Levin, Robert E., 4,545,001, Cl. 362-340.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural pyridinesulfonamides. 4,544,401, Cl. 71-92.000.
Levy, Ellen R. Belt construction. 4,543,672, Cl. 2-321.000.
Levy, Stanley B., to Du Pont de Nemours, E. I., and Company. Chlorotrifluouroethylene polymer oriented films. 4,544,721, Cl. 526-249.000.
Lew, Hyok S.; and Lew, Yon S. Slide connectors with locking means. 4,544,300, Cl. 403-170.000.
Lew, Yon S.: *See—*
Lew, Hyok S.; and Lew, Yon S., 4,544,300, Cl. 403-170.000.
Lewis, Henry G., Jr.; and Stiller, Thomas M., to RCA Corporation. Logarithmic color matrix for a digital television receiver. 4,544,945, Cl. 358-30.000.
Leybold Heraeus GmbH: *See—*
Munz, Wolf D.; and Hessberger, Gerhard, 4,544,468, Cl. 204-192.00R.
LGZ Landis & Gyr Zug AG: *See—*
Antes, Gregor, 4,544,266, Cl. 356-71.000.
Li, Hsin L.; and Oswald, Hendrikus J., to Allied Corporation. Foamed polyamide fibers. 4,544,594, Cl. 428-92.000.
Licentia Patent-Verwaltungs-GmbH: *See—*
Hauk, Waldemar; Krull, Klaus; and Welzenbach, Manfred, 4,545,048, Cl. 370-1.000.
Liche, Udo: *See—*
Borgert, Bernhard; and Liche, Udo, 4,544,593, Cl. 428-80.000.
Lickei, Donald L.: *See—*
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,544,730, Cl. 528-78.000.
Liebert Corporation: *See—*
Powell, Jeffrey M., 4,544,877, Cl. 323-308.000.
Lin, Yang-i: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,544,759, Cl. 556-36.000.
Lindauer Dornier Gesellschaft mbH: *See—*
John, Heinz, deceased; and John nee Rueffler, Friedlinde, Heir, 4,543,696, Cl. 28-206.000.
Linde Aktiengesellschaft: *See—*
Eckhardt, Erich, 4,543,787, Cl. 60-444.000.
Heyl, Walter; and Loffler, Thomas, 4,543,876, Cl. 91-506.000.
Metschl, Michael; and Koch, Hannsjorg, 4,544,384, Cl. 55-180.000.
Lindskog, Kjell J. Method and apparatus for the manufacture of shaped articles from fibre-reinforced plastics material. 4,544,518, Cl. 264-257.000.
Lindstrom, Merlin R., to Phillips Petroleum Company. Process of making U.V. cured polyurethanes using diazonium salt promoters. 4,544,466, Cl. 204-159.110.
Linkert, Reinhold; Becker, Emil; and Hoffmann, Horst, to George Fischer Aktiengesellschaft. Process for producing cast iron castings with a vermicular graphite structure. 4,544,407, Cl. 75-130.00A.
Lintunen, Tuomo, to Enso-Gutzeit Osakeyhtio . Filter press. 4,544,448, Cl. 162-360.100.
Lion Corporation: *See—*
Ukigai, Toshiyuki; Hagiwara, Masaaki; and Yamada, Junichi, 4,544,033, Cl. 166-274.000.
Lippold, Heinrich: *See—*
Wecker, Dietmar; and Lippold, Heinrich, 4,543,727, Cl. 33-228.000.
Lisle Corporation: *See—*
Miller, Merrill R., 4,544,067, Cl. 211-70.600.
Lissau, Frederic, to Sloan Valve Company. Over-the-road vehicle automatic slack adjuster. 4,544,046, Cl. 188-79.50K.
Lissau, Frederic: *See—*
Allen, Charles S.; Berg, Arthur A.; Schmitt, Eugene W.; Stoltenberg, Michael R.; and Lissau, Frederic, 4,544,132, Cl. 251-318.000.
Litovitz, Theodore A.: *See—*
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,544,499, Cl. 252-629.000.
Litton Systems, Inc.: *See—*
Klostermann, Heinrich F., 4,545,064, Cl. 378-132.000.
Shone, Michael F.; and Belt, Roger F., 4,544,239, Cl. 350-376.000.
Litz, Lawrence M., to Union Carbide Corporation. Process for the uniform distribution of a two phase mixture. 4,544,207, Cl. 299-5.000.
Litzen, Karl-Axel, to Boliden Aktiebolag. Method for atomization and device for carrying out the method. 4,544,095, Cl. 239-8.000.
Livermore, Frederick C.: *See—*
Anderson, James E.; Coleman, Michael J.; and Livermore, Frederick C., 4,544,983, Cl. 361-119.000.
Loch, Werner: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,544,687, Cl. 523-414.000.
Lockhart, David L.: *See—*
Elrick, Edwin, 4,544,079, Cl. 220-277.000.
Lockheed Corporation: *See—*
Drapala, Thaddeus R.; and Zaman, Mohammad K., 4,545,077, Cl. 455-612.000.
Schuster, John H., 4,544,117, Cl. 244-210.000.
Loffler, Thomas: *See—*
Heyl, Walter; and Loffler, Thomas, 4,543,876, Cl. 91-506.000.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Diskette filing and storage container. 4,544,213, Cl. 312-183.000.
Long, Raymond H.; and Schindler, Harvey D., to Lummus Company, The. Coal liquefaction and hydrogenation. 4,544,476, Cl. 208-8.0LE.
Loral Corporation: *See—*
Patel, Jayantilal, 4,545,055, Cl. 371-55.000.
Lorenz, Kurt: *See—*
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,544,451, Cl. 202-114.000.
Lorenzen, Heinz-Christen: *See—*
Brand, Peter; Lorenzen, Heinz-Christen; Heitmann, Uwe; and Menzel, Peter, 4,543,816, Cl. 73-37.600.
Loring, Dennis J., to Elmwood Sensors, Inc. Magnetically operated AC switching device with delay-on-dropout. 4,544,987, Cl. 361-194.000.
Lorson, E. William, to Copeland Corporation. Discharge valve assembly for refrigeration compressors. 4,543,989, Cl. 137-543.190.
Los, Marinus, to American Cyanamid Company. Preparation of imidazolinyl benzoic acids, esters and salts. 4,544,754, Cl. 548-301.000.
Losert, Ewald: *See—*
Audykowski, Thaddeus; Mentha, Anton; and Losert, Ewald, 4,544,623, Cl. 430-280.000.
Louth, Kenneth, to Ampex Corporation. Automatic scan tracking servo system. 4,544,967, Cl. 360-77.000.
Lowel-Lighy Manufacturing, Inc.: *See—*
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, 4,544,120, Cl. 248-122.000.
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, to Lowel-Lighy Manufacturing, Inc. Flag frame and clamp. 4,544,120, Cl. 248-122.000.
Lucas Industries: *See—*
Fitzmaurice, Ian P., 4,543,782, Cl. 60-39.281.
Lucas Industries Limited: *See—*
Best, Christopher H.; and Seilly, Alec H., 4,544,905, Cl. 336-136.000.
Lucas Industries Public Limited Company: *See—*
Farr, Glyn P. R., 4,543,976, Cl. 137-101.000.
Harris, Kenneth M., 4,543,914, Cl. 123-41.310.
Luchetti, Lorenzo, to Interimport F. Caceffo GmbH. Heat efficient cooking apparatus. 4,543,878, Cl. 99-330.000.
Luck, Stephen K. Handle for strap wrenches and other tools. 4,543,858, Cl. 81/64.000.
Luhn, Dennis A.; and Norrick, Daniel A., to McGraw-Edison Company. Engine control circuit. 4,543,927, Cl. 123-182.000.
Luka, Robert E., to Tektronix, Inc. Cable stripper. 4,543,717, Cl. 30-90.600.

Lumma, William C., Jr.: *See—*
Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., 4,544,654, Cl. 514-210.000.

Lummus Company, The: *See—*
Long, Raymond H.; and Schindler, Harvey D., 4,544,476, Cl. 208-8.0LE.

Lunka, Harold: *See—*
Baer, James R.; Manes, Kenneth; and Lunka, Harold, 4,545,045, Cl. 369-77.200.

Lunz, Alfred-Gunther: *See—*
Meisner, Alfred; and Lunz, Alfred-Gunther, 4,544,813, Cl. 200-38.00R.

Luperti, Harry E.: *See—*
Irvine, Robert; Luperti, Harry E.; and Bayliss, Keith, 4,544,150, Cl. 271-145.000.

Lupoli, Peter J.; and Comerford, John J., to Casco Products Corporation. Two-piece clamp shell for electric cigar lighter. 4,544,226, Cl. 339-130.00R.

Lutenegger, Alan J.: *See—*
Handy, Richard L.; and Lutenegger, Alan J., 4,543,820, Cl. 73-84.000.

Luther, Lars C.; and Rana, Virendra V. S., to AT&T Bell Laboratories. Liquid phase epitaxial growth of bismuth-containing garnet films. 4,544,438, Cl. 156-624.000.

Luther, Thomas A.: *See—*
Kwon, Ki C.; and Luther, Thomas A., 4,544,211, Cl. 308-6.00C.

Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., to Infinet Inc. Enhanced communications network testing and control system. 4,545,011, Cl. 364-200.000.

Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., to Infinet Inc. Enhanced communications network testing and control system. 4,545,013, Cl. 364-200.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Glasmeyer, Ulrich; and Willaschek, Horst, 4,544,405, Cl. 75-51.200.

M-Rel, Inc.: *See—*
Murray, John D.; and Weiss, Sydney J., 4,544,886, Cl. 324-158.00F.

Ma, Thomas T., to Ford Motor Company. Intake manifold for an internal combustion engine. 4,543,918, Cl. 123-52.0MB.

MacDiarmid, Joan E.: *See—*
Bardos, Thomas J.; Perlman, Michael E.; and MacDiarmid, Joan E., 4,544,501, Cl. 260-239.0EP.

Macedo, Pedro B.: *See—*
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,544,499, Cl. 252-629.000.

Machida, Hazime: *See—*
Kobayashi, Hiroshi; Machida, Hazime; and Tanaka, Motoharu, 4,544,602, Cl. 428-336.000.

Macioch, Michael T., to Minnesota Mining and Manufacturing Company. Tannable multi-colored material. 4,544,620, Cl. 430-264.000.

Mack, Ernst: *See—*
Sonneborn, Siegfried; Handel, Manfred; and Mack, Ernst, 4,543,753, Cl. 52-15.000.

Mack Trucks, Inc.: *See—*
Kronstadt, Victor, 4,544,055, Cl. 192-70.120.

Mack, William R.: *See—*
Buchanan, Harry C., Jr.; Mack, William R.; and Malhotra, Jagmohan K., 4,543,839, Cl. 74-98.000.

MacKay, Kenneth D.: *See—*
Kordosky, Gary A.; Sudderth, R. Brantley; Sierakoski, J. Michael; and MacKay, Kenneth D., 4,544,532, Cl. 423-24.000.

Mackey, Phillip J.; and Bailey, J. Barry W., to Noranda Inc. Process and apparatus for continuous converting of copper and non-ferrous mattes. 4,544,141, Cl. 266-215.000.

Maeda, Koichi; and Ito, Haruo, to Hewlett-Packard Company. Stimulus/measuring unit for DC characteristics measuring. 4,544,879, Cl. 324-57.00R.

Maeda, Kunihiro; and Miyoshi, Tadahiko, to Hitachi, Ltd. Silicon carbide electrical insulator material of low dielectric constant. 4,544,642, Cl. 501-88.000.

Maehara, Yoshimi, to Hitachi Maxell Ltd. Magnetic recording tape cartridge. 4,544,062, Cl. 206-509.000.

Maejima, Hisashi: *See—*
Nagatomo, Hiroto; Maejima, Hisashi; Suzuki, Jun; and Fujikawa, Keishin, 4,544,318, Cl. 414-222.000.

Maekawa, Hitoshi: *See—*
Osawa, Michitaka; Funada, Etuo; Miyajima, Hiroyuki; Maekawa, Hitoshi; and Ando, Kunio, 4,544,896, Cl. 330-284.000.

Maemori, Takashi; and Kamata, Kazuo, to Fuji Photo Film Co., Ltd. Incorrect lens setting detection device for wide-angle/telephotography convertible camera. 4,544,249, Cl. 354-195.120.

Magnetic Peripherals Inc.: *See—*
Albert, Glenn D., 4,544,890, Cl. 324-163.000.

Maher, David P.; and Rance, Robert J., to AT&T Bell Laboratories. Hybrid natural random number generator. 4,545,024, Cl. 364-717.000.

Mahn, Dieter: *See—*
Faeser, Ulrich; and Mahn, Dieter, 4,544,336, Cl. 417-412.000.

Maier, Peter; and Sigel, Albert. Table saw outfit. 4,543,866, Cl. 83-471.300.

Mailliet, Pierre: *See—*
Cooper, Arthur; and Mailliet, Pierre, 4,544,143, Cl. 266-273.000.

Mak, Stephen M., to Iodata, Inc. Method and apparatus for character code compression and expansion. 4,545,032, Cl. 364-900.000.

Malanaphy, Richard H.: *See—*
Adleman, Larry G.; and Malanaphy, Richard H., 4,543,722, Cl. 30-360.000.

Malesci S.p.A. Istituto Farmacologico: *See—*
Fedi, Mauro; and Bonacchi, Graziano, 4,544,556, Cl. 514-263.000.

Malhotra, Jagmohan K.: *See—*
Buchanan, Harry C., Jr.; Mack, William R.; and Malhotra, Jagmohan K., 4,543,839, Cl. 74-98.000.

Malin, James I. Quick coupling and lift device. 4,544,323, Cl. 414-785.000.

Mallek, Heinz; Laser, Manfred; and Ermisch, Dorothee, to Kernforschungsanlage Julich GmbH. Apparatus for burning organic materials. 4,544,374, Cl. 48-114.000.

Malvern Scale Company: *See—*
Stuart, James M., 4,544,043, Cl. 177-194.000.

Management Assistance, Inc.: *See—*
Denny, Alan, 4,544,217, Cl. 339-17.00M.

Mancinelli, Paul A., to Atlantic Richfield Company. Process for making terminally functional polymers. 4,544,711, Cl. 525-348.000.

Mandel, Goetz, to Messerschmitt-Bolkow-Blohm GmbH. Method of manufacturing a pressure tank. 4,544,428, Cl. 156-161.000.

Manenkov, Jury A.: *See—*
Fomin, Viktor I.; Guzenko, Stanislav I.; Egai, Mikhail N.; and Manenkov, Jury A., 4,545,042, Cl. 367-189.000.

Manes, Kenneth: *See—*
Baer, James R.; Manes, Kenneth; and Lunka, Harold, 4,545,045, Cl. 369-77.200.

Manley, Robert V., Jr.: *See—*
Schiele, Edward K.; Manley, Robert V., Jr.; and Rerat, Carlos F., 4,544,403, Cl. 75-0.5AB.

Mannesmann AG: *See—*
Peterseim, Heinz; and Leutz, Walter, 4,544,138, Cl. 266-44.000.
Tenberg, Werner; and Kolb, Gustav, 4,544,140, Cl. 266-99.000.

Mannesmann Rexroth GmbH: *See—*
Imhof, Rainer, 4,543,875, Cl. 91-459.000.

Manning, Robert E.; and Nadelson, Jeffrey, to Sandoz, Inc. Indolamine derivatives as anti-fertility agents. 4,544,663, Cl. 514-378.000.

Manville Service Corporation: *See—*
Hoelzer, Robert J., 4,544,685, Cl. 523-200.000.

MAP Mikrofilm Apparatebau Dr. Poehler GmbH & Co., KG: *See—*
Dziemba, Peter, 4,544,151, Cl. 271-251.000.

Maples, Stephen S., to Acer Automation Company. Automatic nulling LVDT probe. 4,543,732, Cl. 33-502.000.

Marcaccioli, Enzo: *See—*
Camprincoli, Pierpaolo; Marcaccioli, Enzo; and Rosati, Luciano, 4,544,606, Cl. 428-454.000.

Marcantonio, Paul J., to Chevron Research Company. Recovering vanadium values from ammonium bicarbonate solution using heat, sulfuric acid, and ammonium sulfate. 4,544,533, Cl. 423-67.000.

Marciniak, Walter J. Air heating and cooling apparatus. 4,544,023, Cl. 165-48.00R.

Maresca, Louis M., to Union Carbide Corporation. Aromatic polyformals. 4,544,705, Cl. 525-132.000.

Mariano, Arturo C.: *See—*
Barker, W. David; Heisey, Raymond K., Jr.; and Mariano, Arturo C., 4,543,760, Cl. 52-544.000.

Marketing Displays, Inc.: *See—*
Seely, James R., 4,544,125, Cl. 248-624.000.

Marsh, Glenn A., to Union Oil Company of California. Galvanic anodes for submergible ferrous metal structures. 4,544,465, Cl. 204-148.000.

Marshall, Bruce: *See—*
Marshall, Tina, 4,543,911, Cl. 119-1.000.

Marshall, Tina, to Marshall, Bruce; and Marshall, Tina. Mittens for canines. 4,543,911, Cl. 119-1.000.

Marsicano, Rosalind. Candle holder. 4,544,351, Cl. 431-288.000.

Marterer, Karl, to Dostmann GmbH & Co. KG. Barometer. 4,543,824, Cl. 73-386.000.

Martin, Joel L.: *See—*
Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., 4,544,718, Cl. 526-141.000.

Martin, Rabian M.: *See—*
Ekeleme, Charles E., Jr.; and Martin, Rabian M., 4,543,987, Cl. 137-540.000.

Martynov, Genrich I.: *See—*
Yetselev, Zinovy N.; and Martynov, Genrich I., 4,544,016, Cl. 164-467.000.

Maru, Hideki; and Mitsui, Tetsuro, to Honda Giken Kogyo Kabushiki Kaisha. Trailing link type beam suspension. 4,544,180, Cl. 280-689.000.

Maruma Jyusharyo Kabushiki Kaisha: *See—*
Moriki, Yasumitsu; Sato, Tadashi; Yamamoto, Kazuyoshi; and Takahashi, Izumi, 4,543,818, Cl. 73-49.800.

Maruyama, Kouji: *See—*
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,544,648, Cl. 502-119.000.

Maruyama, Teruo. Rotary compressor with two or more suction parts. 4,544,337, Cl. 418-15.000.

Maruyama, Tokuji: *See—*
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.

Marven, Al: *See—*
Hill, James J.; and Marven, Al, 4,544,086, Cl. 222-649.000.

Marvin Glass & Associates: *See—*
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,544,162, Cl. 273-242.000.

Rasmussen, Russell G.; Peinsipp, Alice A.; and Breslow, Jeffrey D., 4,544,156, Cl. 273-5.00A.

Marx, Hans-Jurgen: *See*—
Hackenbeck, Dietmar; and Marx, Hans-Jurgen, 4,544,106, Cl. 241-101.00A.

Maschinenfabrik Andritz Actiengesellschaft: *See*—
Pinter, Reinhard; Petschauer, Franz; and Sbaschnigg, Johann, 4,544,447, Cl. 162-300.000.

Mason, Donald C.: *See*—
Phillips, Robert L.; Phillips, R. Daryl; and Mason, Donald C., 4,543,948, Cl. 128-80.00A.

Masse, Fernard J.: *See*—
Drake, Anthony F.; Masse, Fernard J.; and Grendahl, Dennis T., 4,543,673, Cl. 623-6.000.

Masugi, Takashi: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,544,653, Cl. 514-202.000.

Material Sciences Corporation: *See*—
Kuziemka, Edmund J., 4,544,692, Cl. 524-361.000.

Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, to Hitachi, Ltd. Method of manufacturing an armature. 4,543,708, Cl. 29-598.000.

Matsubara, Nobuyuki: *See*—
Yoshinaga, Minoru; and Matsubara, Nobuyuki, 4,544,113, Cl. 242-178.000.

Matsuda, Yoshio: *See*—
Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, 4,543,805, Cl. 66-148.000.

Matsuda, Yuji: *See*—
Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, 4,544,989, Cl. 361-401.000.

Matsuhisa, Noboru: *See*—
Miyazaki, Tomohiro; Tanaka, Hitoshi; Matsumoto, Goro; Matsuhisa, Noboru; and Omatoi, Susumu, 4,544,605, Cl. 428-404.000.

Matsui, Isamu; Yamamoto, Yoshio; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimamoto, Akira, to Murata Kikai Kabushiki Kaisha. Cop delivery system. 4,544,107, Cl. 242-35.50A.

Matsumoto, Goro: *See*—
Miyazaki, Tomohiro; Tanaka, Hitoshi; Matsumoto, Goro; Matsuhisa, Noboru; and Omatoi, Susumu, 4,544,605, Cl. 428-404.000.

Matsumoto, Keiichi: *See*—
Hirano, Hiroyuki; and Matsumoto, Keiichi, 4,544,872, Cl. 318-632.000.

Matsumoto, Kouichi: *See*—
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, 4,543,923, Cl. 123-179.00F.

Matsumoto, Motoki: *See*—
Nakamura, Kazuharu; and Matsumoto, Motoki, 4,544,349, Cl. 431-258.000.

Matsushima, Hiroshi: *See*—
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, 4,544,962, Cl. 360-40.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fukunaga, Masao; and Nonoguchi, Hiroshi, 4,543,968, Cl. 132-33.00R.
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, 4,544,962, Cl. 360-40.000.
Moriya, Mitsuro; and Ichinose, Makoto, 4,544,957, Cl. 358-338.000.
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,545,044, Cl. 369-32.000.
Suzuki, Masaki; and Hasegawa, Mikio, 4,545,021, Cl. 364-571.000.
Taniguchi, Hiroshi; Ohtsu, Masamitsu; and Kubo, Kanji, 4,544,966, Cl. 360-75.000.

Matsutani, Kinya; and Sasaki, Katutoki, to Kabushiki Kaisha Toshiba. Superconducting magnet device. 4,543,794, Cl. 62-54.000.

Mattel, Inc.: *See*—
Scholey, Michael F., 4,544,094, Cl. 238-10.00R.

Matz, Bruno: *See*—
Kearney, Dolores C.; Giza, Peter; and Matz, Bruno, 4,544,013, Cl. 164-5.000.

Matzner, Bruce: *See*—
Curulla, Michael V.; Price, John F.; Matzner, Bruce; Brayman, Kenneth W.; and Qurnell, Frank D., 4,544,522, Cl. 376-441.000.

Maurer, Albrecht; and Frey, Karl, to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG. Device for holding and advancing the stock to be sliced on a cold meat slicing machine. 4,543,868, Cl. 83-713.000.

Maurer, Martin, to Hydrel Ag. Method for winding a thread on a bobbin and electro-hydraulic traverse motion device for carrying out the method. 4,544,108, Cl. 242-43.00R.

Maurer, Robert S.; and Tsai, Min H., to Unitek Corporation. Orthodontic appliance for direct bonding to a tooth. 4,544,353, Cl. 433-9.000.

Maurer, Thomas; Gauch, Wolfgang; and Devrient, Ludwig, to GAO Gesellschaft fur Automation und Organisation mbH. Identification card. 4,544,181, Cl. 283-74.000.

Mawby, Harold S.; and Johnston, Burdith W., to White Consolidated Industries, Inc. Refrigerator door hinge. 4,543,800, Cl. 62-339.000.

Maxwell, Jerrold F. Transmission apparatus. 4,543,840, Cl. 74-342.000.

May, Ruth A., to E. F. Johnson Company. Process for metallization of dielectric substrate through holes. 4,544,577, Cl. 427-97.000.

Mayer, Jurgen: *See*—
Kessler, Peter-Jurgen; Mayer, Jurgen; and Weiler, Paul, 4,543,682, Cl. 15-250.420.

Mayr, Adolfe; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettoro, to Montecatini Edison S.p.A. Polymerization catalysts. 4,544,717, Cl. 526-125.000.

Mays, Thomas D.: *See*—
Keggins, Kathleen M.; Davis, Ann C.; Sybert, Edward M.; Mays, Thomas D.; and Milch, Robert A., 4,544,637, Cl. 435-253.000.

Mazda Motor Corporation: *See*—
Hitomi, Mitsuo; and Oda, Hiroyuki, 4,543,931, Cl. 123-308.000.
Takubo, Hiroichi; and Sasaki, Hiroshi, 4,543,926, Cl. 123-242.000.

McAdams, Hiramie T.: *See*—
Hahn, William F.; McAdams, Hiramie T.; and Talley, Robert L., 4,544,101, Cl. 241-24.000.
Hahn, William F.; and McAdams, Hiramie T., 4,544,102, Cl. 241-24.000.

McAfee, Richard C.: *See*—
Streusand, Marie J.; Getson, John C.; and McAfee, Richard C., 4,544,696, Cl. 524-428.000.

McBean, Lionel B.: *See*—
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Heat sinks with staked solderable studs. 4,544,942, Cl. 357-81.000.

McClure, Nathaniel D.: *See*—
Weaver, John R., II; and McClure, Nathaniel D., 4,544,940, Cl. 357-35.000.

McCollough, William L.; and Wulczynski, Frank J., to Crucible Materials Corporation. Cladding method for producing a lined alloy article. 4,544,523, Cl. 419-8.000.

McCready, Russell J., to General Electric Company. Modified thermoplastic copolyetherimide ester elastomers. 4,544,734, Cl. 528-288.000.

McDonnell, Damien G.: *See*—
Abdullah, Hilal M.; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Toyne, Kenneth J., 4,544,497, Cl. 252-299.500.

McGhee, R. Wayne: *See*—
Ennis, Robert M., Jr.; Coffey, D. Michael; and McGhee, R. Wayne, 4,544,979, Cl. 361-19.000.

McGourty, Lawrence F.: *See*—
McGourty, Thomas K.; and McGourty, Lawrence F., 4,544,289, Cl. 400-154.500.

McGourty, Thomas K.; and McGourty, Lawrence F., to Varitronic Systems, Inc. Print disk positioning system. 4,544,289, Cl. 400-154.500.

McGraw-Edison Company: *See*—
Luhn, Dennis A.; and Norrick, Daniel A., 4,543,927, Cl. 123-182.000.

McInerney, Robert J.: *See*—
Hochanadel, Thomas A.; and McInerney, Robert J., 4,543,864, Cl. 83-91.000.

McKenney, John D., to Lear Siegler, Inc. Portable traffic signalling apparatus and methods therefor. 4,543,905, Cl. 116-63.00P.

McKenzie, James A.: *See*—
Ulmer, Richard W.; and McKenzie, James A., 4,544,854, Cl. 307-576.000.

McKenzie, Thomas C.: *See*—
Epstein, Joseph W.; McKenzie, Thomas C.; and Fanshawe, William J., 4,544,665, Cl. 514-412.000.

McKesson Corporation: *See*—
Stansbury, Benjamin H., Jr., 4,544,245, Cl. 351-120.000.

McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., to Wirtz Manufacturing Company, Inc. Machine for continuously casting battery grids. 4,544,014, Cl. 164-429.000.

McNeill, James D.: *See*—
Kaufman, Alexander A.; and McNeill, James D., 4,544,892, Cl. 324-334.000.

McNutt, Randy A.: *See*—
Goodman, David S.; Selvin, Gerald J.; Naus, Hubert W.; Rofer, David; and McNutt, Randy A., 4,544,224, Cl. 339-89.00M.

Mead Corporation, The: *See*—
Paranjpe, Suresh C., 4,544,930, Cl. 346-75.000.

Meador, Charles G.; and Breashears, Eddie H., to Texas Instruments Incorporated. Passivation of silicon oxide during photoresist burnoff. 4,544,416, Cl. 148-1.500.

Measurex Corporation: *See*—
Boissevain, Mathew, 4,543,737, Cl. 34-92.000.

Mecseki Szenbanyak: *See*—
Gyurko, Istvan; Czeininger, Csaba; Mosko, Karoly; and Nagy, Ferenc, 4,544,676, Cl. 521-84.100.

Medero, Richard; Hood, Rush W.; Apple, Howard P.; and Ramsey, Maynard, III, to Critikon, Inc. Method of automated blood pressure detection. 4,543,962, Cl. 128-682.000.

Medgyesi, Andras: *See*—
Karacsonyi nee Eva Spindler, Belane ; Racz, Bela; Boszormenyi, Istvan; Kiraly, Laszlo ; and Medgyesi, Andras, 4,544,410, Cl. 106-278.000.

Meiller, Hermann; and Storch, Helmut, to Grammer, Willibald. Seat cushion with a textile cover. 4,544,598, Cl. 428-246.000.

Meisan Ltd., Co.: *See*—
Ichikawa, Shigeru, 4,543,867, Cl. 83-502.000.

Meisner, Alfred; and Lunz, Alfred-Gunther, to Diehl GmbH & Co. Indexing plate for a time switch. 4,544,813, Cl. 200-38.00R.

Meissner, Konrad E.; and Colombo, John W., to Atlas Pacific Engineering Company. Can detection and switch mechanism for can filling apparatus. 4,544,005, Cl. 141-94.000.

Melchert, Walter K., to General Motors Corporation. Molding apparatus for simultaneously forming a cavity and encapsulating a frame in a foamed body. 4,544,126, Cl. 249-83.000.

Melchior, Bernd, to IMC Acrylguss GmbH. Method of making glass panels with selective radiation-blocking effect. 4,544,575, Cl. 427-74.000.

Melchior, Donald L.: *See*—
Ryan, Patrick J.; Davis, Michael A.; and Melchior, Donald L., 4,544,545, Cl. 424-1.100.

Mentha, Anton: *See*—
Audykowski, Thaddeus; Mentha, Anton; and Losert, Ewald, 4,544,623, Cl. 430-280.000.

Menzel, Peter: *See*—
Brand, Peter; Lorenzen, Heinz-Christen; Heitmann, Uwe; and Menzel, Peter, 4,543,816, Cl. 73-37.600.

Mercer, Scott A.: *See*—
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., 4,544,149, Cl. 271-107.000.

Merchuk, Josef: *See*—
Pack, Isak; Veintraub, David; Yarkoni, Abraham; and Merchuk, Josef, 4,543,965, Cl. 128-748.000.

Merck & Co., Inc.: *See*—
Andrus, W. Alexander; Christensen, Burton G.; and Heck, James V., 4,544,557, Cl. 514-210.000.
Durette, Philippe L., 4,544,502, Cl. 260-349.000.
Shepard, Kenneth L.; and Graham, Samuel L., 4,544,667, Cl. 514-470.000.

Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—
Franz, Klaus-Dieter; Kieser, Manfred; and Stahlecker, Otto, 4,544,415, Cl. 106-288.00R.
Romer, Michael; Krause, Joachim; and Weber, Georg, 4,544,771, Cl. 568-329.000.

Merlin Gerin: *See*—
Henry, Georges; and Kieffer, Jean, 4,543,712, Cl. 29-825.000.

Mernoe, Erik C., to De Forenede Bryggerier A/S. Apparatus for combining several rows of bottles or similar objects on an inlet conveyor to a single row on an outlet conveyor. 4,544,059, Cl. 198-453.000.

Mesiya, Mohammed F.: *See*—
Miller, Gary E.; Mesiya, Mohammed F.; and Deichmiller, Arthur C., 4,545,075, Cl. 155-612.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Fuchs, Franz, 4,543,991, Cl. 137-595.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Mandel, Goetz, 4,544,428, Cl. 156-161.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Haselmaker, Karl, 4,544,383, Cl. 55-129.000.

Methode Electronics, Inc.: *See*—
Brevick, Arnold A., 4,544,811, Cl. 200-5.00R.

Metschl, Michael; and Koch, Hannsjorg, to Linde Aktiengesellschaft. Adsorber for two-component recovery and method of operating same. 4,544,384, Cl. 55-180.000.

Metz, Rudi; and Scholl, Herbert, to EMAG Maschinenfabrik GmbH. Lifting electromagnet. 4,544,985, Cl. 361-144.000.

Metzger, Karl G.: *See*—
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,544,658, Cl. 514-254.000.

Meuleman, Guy A., to Aqua Control, Inc. Irrigation valve. 4,543,990, Cl. 137-556.000.

Meurer Druck & Carton GmbH: *See*—
Vossen, Franz, 4,544,367, Cl. 493-1.000.

Meyer, Wolfgang, to U.S. Philips Corporation. Optical pressure transducer. 4,543,831, Cl. 73-705.000.

Meyerhoff, Robert W., to Ergenics, Inc. Hydrogen from ammonia. 4,544,527, Cl. 422-188.000.

Meyers, James F.: *See*—
Hepner, Timothy E.; and Meyers, James F., 4,545,025, Cl. 364-728.000.

Mi-Jack Products, Inc.: *See*—
Sickler, Emory J., 4,544,070, Cl. 212-147.000.

Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,544,783, Cl. 585-469.000.

Michal, Gerhard: *See*—
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.

Michel, Christian: *See*—
Dumas, Daniel; du Mesnildot, Bruno; and Michel, Christian, 4,544,641, Cl. 501-87.000.

Michel, Troyon E., to University de Reims Champagne Ardenne. Electron gun with a field emission cathode and a magnetic lens. 4,544,845, Cl. 250-396.00R.

Micronix Partners: *See*—
Husain, Anwar, 4,544,311, Cl. 409-224.000.

Mifune, Takao: *See*—
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.

Mihara, Osamu. Construction of hull of vessel such as tanker. 4,543,902, Cl. 114-74.00R.

Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,544,628, Cl. 430-572.000.

Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Hopper door actuating apparatus for an automatic weighing apparatus. 4,544,042, Cl. 177-25.000.

Milch, Robert A.: *See*—
Keggins, Kathleen M.; Davis, Ann C.; Sybert, Edward M.; Mays, Thomas D.; and Milch, Robert A., 4,544,637, Cl. 435-253.000.

Milczarek, Richard J.: *See*—
Anderson, Thomas W.; Milczarek, Richard J.; and Peters, Carl H., 4,545,043, Cl. 369-32.000.

Miller, Aaron B. Drilling jig for flathead screw pilot holes. 4,544,307, Cl. 408-72.00B.

Miller, Calvin M.: *See*—
DeVeau, George F., Jr.; and Miller, Calvin M., 4,544,234, Cl. 350-96.210.

Miller, Gary E.; Mesiya, Mohammed F.; and Deichmiller, Arthur C., to Times Fiber Communications, Inc. Satellite block transmission using wideband fiber optic links. 4,545,075, Cl. 155-612.000.

Miller, Merrill R., to Lisle Corporation. Magnetic tool holder. 4,544,067, Cl. 211-70.600.

Miller Products, Inc.: *See*—
Egan, James R., 4,544,590, Cl. 428-40.000.

Miller, Richard F.; and Nicholson, Michael P., to Atlantic Richfield Company. Alkylation aide for sulfuric acid catalyzed alkylation units. 4,544,794, Cl. 585-721.000.

Miller, Richard F.; and Nicholson, Michael P., to Atlantic Richfield Company. Alkylation aide for sulfuric acid catalyzed alkylation units. 4,544,795, Cl. 585-721.000.

Miller, Thomas R., to Concoco Inc. Degasification of coal. 4,544,208, Cl. 299-12.000.

Miller, Walter E., to Black & Decker Inc. Thermostatically controlled electric kettle. 4,544,830, Cl. 219-328.000.

Miller, Walter J., to Pennwalt Corporation. Method of manufacture of EMI/RFI vapor deposited composite shielding panel. 4,544,571, Cl. 427-40.000.

Millot, Jean-Paul; Desfontaines, Guy; and Babin, Michel, to Framatome & Cie. Actuating device for two clusters of control rods movable vertically in one and the same fuel array of the core of a nuclear reactor. 4,544,521, Cl. 376-209.000.

Milne, Robin I.; and Kirkland, Lester, to Mitel Corporation. Telephone indicator. 4,544,808, Cl. 179-99.0LS.

Minagawa, Yoshiji: *See*—
Yamazaki, Hiroyoshi; Minagawa, Yoshiji; Tsuchihashi, Michihiro; Anzai, Yoshinori; and Kajiwara, Toshiro, 4,544,862, Cl. 315-209.00R.

Minamida, Ataru, to Asahi Giken Kogyo Kabushiki Kaisha. Cooking utensil for induction cooking apparatus. 4,544,818, Cl. 219-10.49R.

Minato, Akira: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.

Miner, Robert A. Practice device for putting strokes. 4,544,160, Cl. 273-186.00C.

Minnesota Mining and Manufacturing Company: *See*—
Bunker, James E.; and Fields, Richard P., 4,544,467, Cl. 204-159.240.
Kausch, William L., 4,544,622, Cl. 430-278.000.
Macioch, Michael T., 4,544,620, Cl. 430-264.000.
Rice, Thomas K.; and Senta, Therese A., 4,544,629, Cl. 435-7.000.
Sandvig, Timothy C.; Ersfeld, Dean A.; and Berg, Eric P., 4,544,572, Cl. 427-44.000.

Minten, Karl; and Krug, William, to Gould Inc. Manganese-tertiary phosphine-polymer complexes. 4,544,707, Cl. 525-330.400.

Miquel, Jean: *See*—
Juguin, Bernard; and Miquel, Jean, 4,544,791, Cl. 585-517.000.

Mistyurik, John D., to Monarch Marking Systems, Inc. Hand-held labeler. 4,544,434, Cl. 156-384.000.

Miszczak, Frank L.: *See*—
Cobb, David A.; and Miszczak, Frank L., 4,544,169, Cl. 277-235.00B.

Mitchell, Ronald W. Harness. 4,543,772, Cl. 54-2.000.

Mitchell, Thomas. Tool for torsion bar removal. 4,544,134, Cl. 254-93.00R.

Mitel Corporation: *See*—
Milne, Robin I.; and Kirkland, Lester, 4,544,808, Cl. 179-99.0LS.

Mito Teck Co., Ltd.: *See*—
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,544,984, Cl. 361-119.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, 4,543,923, Cl. 123-179.00F.
Yamazaki, Hiroyoshi; Minagawa, Yoshiji; Tsuchihashi, Michihiro; Anzai, Yoshinori; and Kajiwara, Toshiro, 4,544,862, Cl. 315-209.00R.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,544,511, Cl. 260-549.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hirano, Takahisa, 4,544,333, Cl. 417-299.000.
Honda, Mitsuyasu; Hino, Masao; and Seto, Toru, 4,544,525, Cl. 422-171.000.

Mitsubishi Petrochemical Company Limited: *See*—
Ayusawa, Tadashi; Aoki, Tadamichi; and Hamana, Ryozo, 4,544,749, Cl. 546-184.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Nishida, Kozi; and Yamamoto, Takashi, 4,544,235, Cl. 350-96.340.
Mitsui, Tetsuro: *See*—
Maru, Hideki; and Mitsui, Tetsuro, 4,544,180, Cl. 280-689.000.
Mitsuishi, Takatoshi: *See*—
Ema, Kenji; Saito, Jun; Mitsuishi, Takatoshi; and Ikado, Shuhei, 4,544,727, Cl. 526-313.000.
Mitsukawa, Zendo, to Satake Engineering, Co., Ltd. Grain handling system. 4,544,280, Cl. 366-141.000.
Mitsuya, Yasunaga: *See*—
Kogure, Kenji; Kakizaki, Takao; Mitsuya, Yasunaga; Oguchi, Shigemitsu; and Otani, Koji, 4,544,972, Cl. 360-105.000.
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, to Fuji Electric Company, Ltd. Pattern discriminator. 4,545,070, Cl. 382-48.000.
Miyajima, Hiroyuki: *See*—
Osawa, Michitaka; Funada, Etuo; Miyajima, Hiroyuki; Maekawa, Hitoshi; and Ando, Kunio, 4,544,896, Cl. 330-284.000.
Miyake, Yukinori: *See*—
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,544,984, Cl. 361-119.000.
Miyashita, Masakazu: *See*—
Shiba, Kazuo; and Miyashita, Masakazu, 4,543,724, Cl. 33-1.00N.
Miyauchi, Nobuyuki: *See*—
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Suyama, Takahiro; and Yano, Seiki, 4,545,057, Cl. 372-45.000.
Miyauchi, Yuh: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,544,511, Cl. 260-549.000.
Miyazaki, Tomohiro; Tanaka, Hitoshi; Matsumoto, Goro; Matsuhisa, Noboru; and Omatoi, Susumu, to Kasei Optonix, Ltd. Phosphor. 4,544,605, Cl. 428-404.000.
Miyoshi, Tadahiko: *See*—
Maeda, Kunihiro; and Miyoshi, Tadahiko, 4,544,642, Cl. 501-88.000.
Miyoshi, Takahito: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,544,601, Cl. 428-330.000.
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, to Swiss Aluminium Ltd. Process for manufacturing solid cathodes. 4,544,524, Cl. 419-9.000.
Mizuno, Toshiaki: *See*—
Amano, Hidetoshi; Abe, Shinichi; Taura, Mitsuharu; and Mizuno, Toshiaki, 4,543,937, Cl. 123-491.000.
Mizunuma, Yasuyuki: *See*—
Shimizu, Hiroshi; and Mizunuma, Yasuyuki, 4,544,857, Cl. 310-313.00B.
Mizusawa Industrial Chemicals, Ltd.: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.
Mizzi, Pierre M. A., to Engineering Project Development Limited. Hand-held computer. 4,545,023, Cl. 364-709.000.
Mobay Chemical Corporation: *See*—
Tideswell, Richard B.; Nodelman, Neil H.; and Phillips, Barry A., 4,544,679, Cl. 521-116.000.
Mobil Oil Corporation: *See*—
Baggett, Gary P.; Peterson, Robert D.; and Penner, Wayne A., 4,545,026, Cl. 364-724.000.
Chang, Clarence D.; and Miale, Joseph N., 4,544,783, Cl. 585-469.000.
Chao, Paul K.; Knob, Kevin J.; and Yurchak, Sergei, 4,544,781, Cl. 585-408.000.
Daviduk, Nicholas; Owen, Hartley; and Wright, Bernard S., 4,544,788, Cl. 585-501.000.
Saliger, Kenneth C., 4,544,036, Cl. 166-341.000.
Smith, Fritz A.; and Tabak, Samuel A., 4,544,792, Cl. 585-533.000.
Yan, Tsoung-Yuan, 4,544,479, Cl. 208-106.000.
Mobil Solar Energy Corporation: *See*—
Stormont, Richard W.; and Eriss, Lawrence, 4,544,528, Cl. 422-246.000.
Mockovciak, John, Jr., to Grumman Aerospace Corporation. Joining techniques for large structures. 4,543,761, Cl. 52-655.000.
Modern Modalities, Inc.: *See*—
Nesbitt, William A., 4,544,587, Cl. 428-34.000.
Modig, Ronald. Holder for liquids. 4,544,087, Cl. 224-148.000.
Moessinger, Albert; Gosciniak, Guy; and Angebault, Joel, to Societe Alasacienne de Construction de Materiel Textile. Weft yarn into the shed of a weaving machine. 4,544,001, Cl. 139-443.000.
Moggi, Giovanni; and Cirillo, Gianna, to Montedison S.p.A. Vulcanizable fluoroelastomer compositions providing vulcanizates having high adhesion to metals. 4,544,708, Cl. 525-337.000.
Moist, Stanford C., Jr.: *See*—
Aiello, Richard E.; Moist, Stanford C., Jr.; Poleshuk, Robert J.; and Wildman, Timothy C., 4,544,220, Cl. 339-59.00M.
Molari, Richard E., Jr., to General Electric Company. Laminar structure of polyester. 4,544,586, Cl. 428-29.000.
Molins PLC: *See*—
Labbe, Francis A. M., 4,543,967, Cl. 131-84.300.
Moll, John H.: *See*—
Yolton, Charles F.; and Moll, John H., 4,544,404, Cl. 75-0.50C.
Molnar, Charles J.: *See*—
Grot, Walther G.; Molnar, Charles J.; and Resnick, Paul R., 4,544,458, Cl. 204-98.000.
Molnar, John, to Caterpillar Tractor Co. Seat and self-locking cushion assembly therefor. 4,544,205, Cl. 297-455.000.
Momiyama, Kikuo; and Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Single lens reflex camera with light measuring device. 4,544,256, Cl. 354-429.000.
Monarch Marking Systems, Inc.: *See*—
Mistyurik, John D., 4,544,434, Cl. 156-384.000.
Monk, Peter H. Heated mitten. 4,543,671, Cl. 2-158.000.
Monreal Urzay, Dario. Process for converting the internal energy of liquid CO_2 into mechanical energy capable of producing work as it changes from liquid to gas over its critical temperature. 4,543,788, Cl. 60-531.000.
Monsanto Company: *See*—
Surgant, John M., 4,544,693, Cl. 524-375.000.
Montagna, Angelo A.: *See*—
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., 4,544,674, Cl. 518-717.000.
Montavon, Marc: *See*—
Brombacher, Urs; Montavon, Marc; Bretschneider, Hermann; Schantl, Joachim; and Turk, Wolfgang, 4,544,659, Cl. 514-297.000.
Montecatini Edison S.p.A.: *See*—
Mayr, Adolfe; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettoro, 4,544,717, Cl. 526-125.000.
Montedison S.p.A.: *See*—
Camprincoli, Pierpaolo; Marcaccioli, Enzo; and Rosati, Luciano, 4,544,606, Cl. 428-454.000.
Moggi, Giovanni; and Cirillo, Gianna, 4,544,708, Cl. 525-337.000.
Montero, Jose T. Denture fixtures. 4,544,358, Cl. 433-172.000.
Montgomery, Dale, to Electralloy Corporation. Wrought alloy body and method. 4,544,420, Cl. 148-37.000.
Moore, Derek S., to Vickers PLC. Optical microscope viewing head with high and low magnification. 4,544,244, Cl. 350-520.000.
Moore, Paul E.; Strohl, Robert L.; and Soisson, Lawrence R., to Arcair Company. Coated exothermic cutting electrode. 4,544,139, Cl. 266-48.000.
Moosmann, Helmut; and Muller, Rolf, to Papst-Motoren GmbH & Co. KG. Circuit arrangement for monitoring speed of a drive motor. 4,544,852, Cl. 307-519.000.
Morawietz, Alfred: *See*—
Lauer, Gerhard; Morawietz, Alfred; and Wild, Jurgen, 4,543,726, Cl. 33-180.00R.
Morgan, Michael A.: *See*—
Mort, Joseph; Jansen, Frank; Grammatica, Steven J.; and Morgan, Michael A., 4,544,617, Cl. 430-58.000.
Moriarity, Aaron J.; and Girsch, Charles W., to Girsch Design Associates. Button worn novelty device. 4,543,740, Cl. 40-315.000.
Moriki, Yasumitsu; Sato, Tadashi; Yamamoto, Kazuyoshi; and Takahashi, Izumi, to Maruma Jyusharyo Kabushiki Kaisha. Seal check apparatus for lubricant-enclosure type track joints of track chains. 4,543,818, Cl. 73-49.800.
Morita, Tatsuo; and Sawamoto, Kunifumi, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine and method therefor. 4,543,934, Cl. 123-435.000.
Moriwaki, Masayoshi: *See*—
Oishi, Kengo; and Moriwaki, Masayoshi, 4,544,975, Cl. 360-130.330.
Moriya, Mitsuro; and Ichinose, Makoto, to Matsushita Electric Industrial Co., Ltd. Time base correction apparatus. 4,544,957, Cl. 358-338.000.
Morris, Christopher P.: *See*—
Brooks, Derrick W.; and Morris, Christopher P., 4,543,736, Cl. 34-46.000.
Morrison, Clyde A.: *See*—
Wortman, Donald E.; Morrison, Clyde A.; and Leavitt, Richard P., 4,545,056, Cl. 372-2.000.
Morsing, Gijsbertus B.: *See*—
Schuiling, Theodorus A.; and Morsing, Gijsbertus B., 4,544,290, Cl. 400-175.000.
Mort, Joseph; Jansen, Frank; Grammatica, Steven J.; and Morgan, Michael A., to Xerox Corporation. Electrophotographic devices containing overcoated amorphous silicon compositions. 4,544,617, Cl. 430-58.000.
Mosaic King (PTY) Ltd: *See*—
Rohrer, Helmuth H., 4,543,759, Cl. 52-475.000.
Moschetto, Samuel J.: *See*—
Chellis, Fred F.; and Moschetto, Samuel J., 4,543,793, Cl. 62-6.000.
Mosko, Karoly: *See*—
Gyurko, Istvan; Czeininger, Csaba; Mosko, Karoly; and Nagy, Ferenc, 4,544,676, Cl. 521-84.100.
Mosser, Mark F.; and Eddinger, Kevin, to Sermatech International Inc. Thixotropic alumina coating compositions, parts and methods. 4,544,408, Cl. 106-14.120.
Mostek Corporation: *See*—
Guterman, Daniel C.; and Jiang, Ching-Lin, 4,545,035, Cl. 365-185.000.
Segers, Dennis L., 4,545,036, Cl. 365-189.000.
Mota, Joaquim S., to U.S. Philips Corporation. Transformer having coaxial coils. 4,544,906, Cl. 336-206.000.
Motoren-und Turbien-Union Munchen: *See*—
Greune, Christian; and Holzhauer, Hilbert, 4,543,783, Cl. 60-226.200.

Motorola, Inc.: *See*—
Freeburg, Thomas A., 4,545,071, Cl. 455-33.000.
Gerson, Ira A., 4,544,919, Cl. 340-347.000.
Skutta, Frank R.; and Klaus, Thomas R., 4,545,072, Cl. 455-183.000.
Ulmer, Richard W.; and McKenzie, James A., 4,544,854, Cl. 307-576.000.
Van Buren, Phillip D.; and Abt, Edgar J., 4,544,913, Cl. 340-347.00P.

Mower, Morton M. Ski boot for concentrating a skier's weight on a ski edge. 4,543,738, Cl. 36-117.000.

Moyers, Thomas E., to United States of America, Army. Image tube IR illuminator indicator. 4,544,844, Cl. 250-330.000.

Mudde, Leo M., to U.S. Philips Corporation. High-voltage supply for an X-ray generator. 4,545,005, Cl. 363-68.000.

Mueller, Carl J. Printer stand. 4,544,065, Cl. 211-13.000.

Muller, Alfred; and Seiffert, Harry, to BBC Brown, Boveri & Company, Limited. Drive and mounting for an open-end spinning unit. 4,543,780, Cl. 57-406.000.

Muller, Peter; Wagner, Kuno; Wegner, Christian; and Schwabe, Peter, to Bayer Aktiengesellschaft. Inorganic-organic fixed-dressings and a process for their production. 4,544,683, Cl. 523-111.000.

Muller, Rolf: *See*—
Moosmann, Helmut; and Muller, Rolf, 4,544,852, Cl. 307-519.000.

Muller, Rudolf R. M., to Multifastener Corporation. Method of attaching a fastener to a panel. 4,543,701, Cl. 29-432.100.

Mullin, John G., Jr.: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.

Mullins, Phillip L.; Neal, James G.; and Perkins, Jeffrey T., to Allied Corporation. Process and apparatus for applying and confining finish. 4,544,579, Cl. 427-175.000.

Multifastener Corporation: *See*—
Muller, Rudolf R. M., 4,543,701, Cl. 29-432.100.

Mundie, Craig J.: *See*—
Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., 4,545,012, Cl. 364-200.000.

Munk, Edmund, to Werzalit-Werke, J.F.Werz KG. Arrangement for producing shaped parts. 4,544,344, Cl. 425-324.100.

Munk, Edmund: *See*—
Werz, Jakob F.; and Munk, Edmund, 4,544,342, Cl. 425-193.000.

Munnerlyn, Charles R., to Cooper Lasersonics, Inc. Heads up display for microscope using remotely controlled instrument. 4,544,243, Cl. 350-514.000.

Munz, Wolf D.; and Hessberger, Gerhard, to Leybold Heraeus GmbH. Method of and apparatus for coating shaped parts by cathodic atomization. 4,544,468, Cl. 204-192.00R.

Muraki, Ryoji; Numata, Seiiti; and Hayashi, Kanji, to Kurashiki Boseki Kabushiki Kaisha. Fuel combustion control system. 4,545,009, Cl. 364-164.000.

Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; Yamamoto, Yoshio; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimamoto, Akira, 4,544,107, Cl. 242-35.50A.

Murata, Mitsuru: *See*—
Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, 4,544,338, Cl. 418-63.000.

Murray, John D.; and Weiss, Sydney J., to M-Rel, Inc. Circuit board test fixture. 4,544,886, Cl. 324-158.00F.

Murray, John M. Truck trailer brake airline lock. 4,543,984, Cl. 137-385.000.

Murtha, Timothy P.: *See*—
Geibel, Jon F.; Clifton, Michael D.; and Murtha, Timothy P., 4,544,735, Cl. 528-374.000.

Murty, V. Balarama, to General Motors Corporation. Brushless DC motor controller. 4,544,868, Cl. 318-254.000.

Musha, Toru; and Ito, Kenichi, to Olympus Optical Co., Ltd. Method and apparatus for detecting tracking error. 4,544,838, Cl. 250-202.000.

Muskulus, Willi, to Statomat-Globe Maschinenfabrik GmbH. Separation of sheet metal elements from a stack. 4,544,315, Cl. 414-115.000.

Mussinelli, Gianluigi: *See*—
Bianchi, Giuseppe; Mussinelli, Gianluigi; and Faita, Giuseppe, 4,544,464, Cl. 204-147.000.

Myers, Charles M.: *See*—
Cranston, Dean H.; and Myers, Charles M., 4,544,293, Cl. 400-320.000.

Myers, Ronald E., to B. F. Goodrich Company, The. Low melting phosphate-sulfate glasses as intumescent flame and/or smoke retardants for polymers. 4,544,695, Cl. 524-405.000.

Nadelson, Jeffrey: *See*—
Manning, Robert E.; and Nadelson, Jeffrey, 4,544,663, Cl. 514-378.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Brake operating device for a bicycle. 4,543,847, Cl. 74-480.00R.

Nagaoka, Satoshi: *See*—
Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, 4,544,628, Cl. 430-572.000.

Nagashima, Akira; and Taomo, Toshio, to Kioritz Corporation. Cooling fan for recoil starter type engine. 4,543,915, Cl. 123-41.650.

Nagashima, Takashi, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake inertia-controlled proportioning. 4,544,210, Cl. 303-6.00C.

Nagata, Muneyoshi; and Kano, Hiroshi, to Nippon Electric Co., Ltd. Invertible inked ribbon cartridge having two sets of feed mechanisms for an impact-serial printer. 4,544,291, Cl. 400-208.000.

Nagatomo, Hiroto; Maejima, Hisashi; Suzuki, Jun; and Fujikawa, Keishin, to Hitachi, Ltd. Manufacturing system. 4,544,318, Cl. 414-222.000.

Nagel, Erich; Huber, Leonhard; and Lammel, Gunter, to Agfa-Gevaert Aktiengesellschaft. Apparatus for introducing strip-shaped material into cassettes or the like. 4,544,110, Cl. 242-67.10R.

Nagel, Robert, to Devine Lighting. Luminaire with lenticular lens. 4,545,007, Cl. 362-329.000.

Nagle, Dennis C.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,544,469, Cl. 204-243.00R.

Nagy, Ferenc: *See*—
Gyurko, Istvan; Czeininger, Csaba; Mosko, Karoly; and Nagy, Ferenc, 4,544,676, Cl. 521-84.100.

Nagy, Janos: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.

Nagy, Louis L.; and O'Rourke, Michael J., to General Motors Corporation. Microwave probe for detecting oil level. 4,543,823, Cl. 73-304.00C.

Nagy, Louis L.; and O'Rourke, Michael J., to General Motors Corporation. Microwave probe for measurement of dielectric constants. 4,544,880, Cl. 324-58.50R.

Naiff, Kenneth L., to General Instrument Corp. Compact ROM with reduced access time. 4,545,033, Cl. 365-51.000.

Naiman, Michael I.; and Schield, John A., to Petrolite Corporation. Ester-containing halopolyalkylenes. 4,544,712, Cl. 525-356.000.

Naito, Ryuichi: *See*—
Tanaka, Megumi; and Naito, Ryuichi, 4,544,837, Cl. 250-201.000.

Nakabo, Seiji, to Nakabo Tekkosho Co., Ltd. Machine tool. 4,543,749, Cl. 51-33.00W.

Nakabo Tekkosho Co., Ltd.: *See*—
Nakabo, Seiji, 4,543,749, Cl. 51-33.00W.

Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, to Sharp Kabushiki Kaisha. Thin assembly for wiring substrate. 4,544,989, Cl. 361-401.000.

Nakagawa, Kazuyuki: *See*—
Ishikawa, Hiroshi; Tabasa, Fujio; and Nakagawa, Kazuyuki, 4,544,747, Cl. 546-156.000.

Nakagawa, Tatsushi: *See*—
Narui, Mamoru; Nakagawa, Tatsushi; and Sakanaka, Yasuhiro, 4,544,709, Cl. 525-344.000.

Nakajima, Hideki, to Shimano Industrial Company Limited. Brake for a fishing reel. 4,544,111, Cl. 242-84.52B.

Nakajima, Yoshihiro: *See*—
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.

Nakama, Daiji, to Nifco, Inc. Locking latch for lid. 4,544,191, Cl. 292-341.150.

Nakamura, Hidenori: *See*—
Shishikura, Toshikazu; Konuma. Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,544,615, Cl. 429-194.000.

Nakamura, Kaoru, to Aisin Seiki Kabushiki Kaisha. Hydraulic pressure cylinder with integrated reservoir. 4,544,075, Cl. 220-82.00R.

Nakamura, Kazuharu; and Matsumoto, Motoki, to Toyotomi Kogyo Co., Ltd. Oil burner comprising safeguard mechanism against power stoppage. 4,544,349, Cl. 431-258.000.

Nakamura, Keiji: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.

Nakamura, Kenichi: *See*—
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.

Nakanishi, Kazuo: *See*—
Matsui, Isamu; Yamamoto, Yoshio; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimamoto, Akira, 4,544,107, Cl. 242-35.50A.

Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, to Kabushiki Kaisha Kobe Seiko Sho; and Shinko Electric Co., Ltd. Method and device for controlling welding power supply to avoid spattering of the weld material. 4,544,826, Cl. 219-137.0PS.

Nakanishi, Yasuhiro, to Sharp Kabushiki Kaisha. Alarm timepiece with facilities of providing precausionary alarm. 4,544,283, Cl. 368-251.000.

Nakano, Masao: *See*—
Nakano, Tomio; Nakano, Masao; and Ogawa, Junji, 4,545,037, Cl. 365-205.000.

Nakano, Tomio; Nakano, Masao; and Ogawa, Junji, to Fujitsu Limited. Dynamic semiconductor memory device with balanced sensing arrangement. 4,545,037, Cl. 365-205.000.

Nalco Chemical Company: *See*—
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,544,719, Cl. 526-240.000.
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,544,722, Cl. 526-264.000.
Reven, Frederick V., 4,544,472, Cl. 204-290.00R.

Nanpei, Masaru; Tomita, Akira; Fujimura, Toshiaki; and Etoh, Kuniomi, to Toyo Boseki Kabnushiki Kaisha. Photosensitive resin composition. 4,544,624, Cl. 430-281.000.

Narasimhan, Mandayam J.: *See*—
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Thirumalachar, Mandayam J. K., 4,544,666, Cl. 514-460.000.
Narayan, Thirumurti, to Basf Wyandotte Corporation. Polyisocyanate binder having low toluene diisocyanate content. 4,544,763, Cl. 560-26.000.
Narui, Mamoru; Nakagawa, Tatsushi; and Sakanaka, Yasuhiro, to Toyo Soda Manufacturing Co., Ltd. Process for producing chlorosulfonated polyethylene using a mixed solvent. 4,544,709, Cl. 525-344.000.
Nate, Kazuo; Inoue, Takashi; Yokono, Hitoshi; Ishikawa, Mitsuo; and Kumada, Makoto, to Hitachi, Ltd. Photo and radiation-sensitive organopolymeric material. 4,544,729, Cl. 528-28.000.
Naumann, Klaus: *See*—
Fuchs, Rainer; and Naumann, Klaus, 4,544,508, Cl. 260-465.00D.
Naus, Hubert W.: *See*—
Goodman, David S.; Selvin, Gerald J.; Naus, Hubert W.; Rofer, David; and McNutt, Randy A., 4,544,224, Cl. 339-89.00M.
NDM Corporation: *See*—
Cartmell, James V., 4,543,958, Cl. 128-640.000.
Neal, James G.: *See*—
Mullins, Phillip L.; Neal, James G.; and Perkins, Jeffrey T., 4,544,579, Cl. 427-175.000.
Neal, Mathew; and Reimers, Jochen, to ITT Industries, Inc. Integrated comparator circuit. 4,544,853, Cl. 307-530.000.
NEC Corporation: *See*—
Shimizu, Hiroshi; and Mizunuma, Yasuyuki, 4,544,857, Cl. 310-313.00B.
Yoshida, Yasuharu, 4,544,894, Cl. 329-122.000.
Neesz, John J.: *See*—
Anderson, Todd B.; Glaser, Thomas W.; and Neesz, John J., 4,544,968, Cl. 360-78.000.
Nelson, John A.: *See*—
Stout, Gregg W.; and Nelson, John A., 4,543,700, Cl. 29-426.400.
Nelson, Marvin D.: *See*—
Dietiker, Paul; Kim, Yong C.; Nelson, Marvin D.; and Olson, Elwyn H., 4,543,974, Cl. 137-66.000.
Nesbitt, William A., to Modern Modalities, Inc. Window insulator. 4,544,587, Cl. 428-34.000.
Nestec S. A.: *See*—
Heyland, Sven; Fournet, Gaston; and Bosch, Hans, 4,544,568, Cl. 426-650.000.
Lechthaler, Jurg, 4,544,563, Cl. 426-276.000.
Neufang, Karl: *See*—
Heise, Klaus-Peter; Kuth, Robert; Neufang, Karl; Pantke, Hellmuth; and Wedemeyer, Karlfried, 4,544,372, Cl. 8-602.000.
Neumann, Fred W.: *See*—
Corbett, John M.; and Neumann, Fred W., 4,544,682, Cl. 521-142.000.
Neumann, Ulrich: *See*—
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Neward, Lance M. Closure for receptacle. 4,544,063, Cl. 206-540.000.
Newell, John H. Valve for furnace stack pipe. 4,543,941, Cl. 126-293.000.
Newport, Derek J.; and Hood, Christopher, to Johnson Matthey Public Limited Company. Memory device. 4,544,834, Cl. 235-487.000.
Newton, Kevin H.: *See*—
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., 4,544,149, Cl. 271-107.000.
NGK Insulators, Ltd.: *See*—
Kaneno, Masayuki, 4,544,607, Cl. 428-472.000.
Kato, Kiminari, 4,544,327, Cl. 416-241.00B.
Nibby, Chester M., Jr.: *See*—
Salas, Edward R.; Fisher, Edwin P.; Johnson, Robert B.; Nibby, Chester M., Jr.; and Boudreau, Daniel A., 4,545,010, Cl. 364-200.000.
Nicholson, Michael P.: *See*—
Miller, Richard F.; and Nicholson, Michael P., 4,544,794, Cl. 585-721.000.
Miller, Richard F.; and Nicholson, Michael P., 4,544,795, Cl. 585-721.000.
Nickel, Horst: *See*—
Stohr, Frank-Michael; and Nickel, Horst, 4,544,737, Cl. 534-605.000.
Nickol, Friedrich W., to VDO Adolf Schindling AG. Substrate having dummy conductors to prevent solder build-up. 4,544,238, Cl. 350-336.000.
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; and Sanders, Georgius B. J., to U.S. Philips Corporation. Ribbon-type transducer with a multi-layer diaphragm. 4,544,806, Cl. 179-115.5PV.
Nifco, Inc.: *See*—
Nakama, Daiji, 4,544,191, Cl. 292-341.150.
Nikko Kogyo Kabushiki Kaisha: *See*—
Katsuura, Nobuo, 4,544,800, Cl. 174-65.0SS.
Nils Weibull AB: *See*—
Herslow, Ernst H., 4,544,316, Cl. 414-144.000.
Nilsson, Rolf; Bjornfoth, Hakan; and Slungaard, Knut, deceased (by Aberg, Kerstin, Guje Slungaard, legal representatives), to AB Bofors. Apparatus for winding wire on a spool. 4,543,808, Cl. 72-137.000.
Nippon Air Brake Co., Ltd.: *See*—
Tanaka, Masakatsu, 4,544,385, Cl. 55-208.000.
Nippon Electric Co., Inc.: *See*—
Oguchi, Tetsuji, 4,545,014, Cl. 364-200.000.
Nippon Electric Co., Ltd.: *See*—
Nagata, Muneyoshi; and Kano, Hiroshi, 4,544,291, Cl. 400-208.000.
Nippon Furnace Kogyo Kaisha, Ltd.: *See*—
Hasegawa, Toshiaki; and Hirose, Yasuo, 4,543,834, Cl. 73-861.050.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kawashima, Susumu; and Yamada, Shigeru, 4,543,869, Cl. 84-1.010.
Nippon Kogaku K. K.: *See*—
Utagawa, Ken, 4,544,255, Cl. 354-406.000.
Nippon Kogaku K.K.: *See*—
Tsukamoto, Masaaki, 4,544,252, Cl. 354-289.100.
Nippon Kokan Kabushiki Kaisha: *See*—
Yamada, Takeo; Uesugi, Mitsuaki; and Okamura, Masaru, 4,544,268, Cl. 356-394.000.
Nippon Oil Company, Ltd.: *See*—
Kojima, Ichiro; Komiya, Kouji; Sato, Hiroshi; and Oguchi, Yutaka, 4,544,633, Cl. 435-86.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Ishii, Osamu; Yoshimura, Fumikatsu; and Hatakeyama, Iwao, 4,544,612, Cl. 428-692.000.
Kogure, Kenji; Kakizaki, Takao; Mitsuya, Yasunaga; Oguchi, Shigemitsu; and Otani, Koji, 4,544,972, Cl. 360-105.000.
Nippondenso Co., Ltd.: *See*—
Amano, Hidetoshi; Abe, Shinichi; Taura, Mitsuharu; and Mizuno, Toshiaki, 4,543,937, Cl. 123-491.000.
Nishi, Yasutaka; Hamada, Masao; Ishikawa, Yoshihide; and Inoue, Setsuo, to Harima Chemicals, Inc. Method of manufacturing aqueous fortified rosin dispersion. 4,544,608, Cl. 428-498.000.
Nishida, Kozi; and Yamamoto, Takashi, to Mitsubishi Rayon Co., Ltd. Plastic optical fibers. 4,544,235, Cl. 350-96.340.
Nishiguchi, Fumio; and Komatsu, Hiroshi, to Nissan Motor Co., Ltd. Variable-capacity radial turbine. 4,544,326, Cl. 415-151.000.
Nishiguchi, Yuzuru; Uchiyama, Shigeru; and Kobayashi, Masaaki, to Shinko Denshi Company Limited. Piezoelectric mechanism for converting weight into frequency. 4,544,858, Cl. 310-321.000.
Nishikawa, Masao; and Ashida, Takahiro, to Takatori Machinery Works Ltd. Automatic method and apparatus for packing stockings or the like. 4,543,768, Cl. 53-117.000.
Nishio, Ken-ichi: *See*—
Okamoto, Hideho; and Nishio, Ken-ichi, 4,544,610, Cl. 428-611.000.
Nishio, Kohsaku: *See*—
Ohno, Yoshio; Koyama, Katsuhiko; and Nishio, Kohsaku, 4,544,247, Cl. 352-62.000.
Nissan Motor Co., Ltd.: *See*—
Karasawa, Kazuo, 4,544,166, Cl. 277-57.000.
Morita, Tatsuo; and Sawamoto, Kunifumi, 4,543,934, Cl. 123-435.000.
Nishiguchi, Fumio; and Komatsu, Hiroshi, 4,544,326, Cl. 415-151.000.
Ochiai, Akira; and Suzuki, Yoshitaka, 4,544,198, Cl. 296-155.000.
Nittan Company, Limited: *See*—
Fujisawa, Takao, 4,544,921, Cl. 340-584.000.
Niven, Jeffrey E.: *See*—
LaBudde, Edward V.; and Niven, Jeffrey E., 4,544,241, Cl. 350-486.000.
Nizel, Robert N.; and Schimmoller, Frank D., to Architectural Resources Cambridge, Inc. Laboratory furniture system. 4,544,214, Cl. 312-209.000.
Noda, Takashi: *See*—
Kataoka, Masao; Oshima, Yujiro; Noda, Takashi; and Suzuki, Shigeo, 4,543,929, Cl. 123-263.000.
Nodelman, Neil H.: *See*—
Tideswell, Richard B.; Nodelman, Neil H.; and Phillips, Barry A., 4,544,679, Cl. 521-116.000.
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic set-up system. 4,543,970, Cl. 134-62.000.
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,544,648, Cl. 502-119.000.
Nomura, Yoshiyuki; Okuda, Kanemasa; and Ishii, Hisao, to Fanuc Ltd. Wire-cut, electric discharge machining method. 4,544,819, Cl. 219-69.00W.
Nonoguchi, Hiroshi: *See*—
Fukunaga, Masao; and Nonoguchi, Hiroshi, 4,543,968, Cl. 132-33.00R.
Noranda Inc.: *See*—
Mackey, Phillip J.; and Bailey, J. Barry W., 4,544,141, Cl. 266-215.000.
Nordson Corporation: *See*—
Hastings, Donald R.; Herstek, Glen A.; and Scarbrough, Don R., 4,543,710, Cl. 29-613.000.
Plunkett, Robert T.; and Inculet, Ion I., 4,544,570, Cl. 427-27.000.
Sharpless, John, 4,543,909, Cl. 118-326.000.
Simashkevich, Richard M.; and Sharp, William J., 4,544,100, Cl. 239-407.000.
Norlander, Norman E. Vise for small objects. 4,544,145, Cl. 269-69.000.
Norrick, Daniel A.: *See*—
Luhn, Dennis A.; and Norrick, Daniel A., 4,543,927, Cl. 123-182.000.
Norris, Harold R. Flow control valve. 4,544,099, Cl. 239-271.000.
North, Howard L., Jr., to Vernitron Corporation. Sterilizer door assembly. 4,543,748, Cl. 49-395.000.
Northern Telecom Limited: *See*—
Anderson, James E.; Coleman, Michael J.; and Livermore, Frederick C., 4,544,983, Cl. 361-119.000.
Arnon, Ephraim, 4,545,060, Cl. 375-14.000.

Bumgardner, Donald L., 4,544,122, Cl. 248-346.000.
Steierman, Herbert L., 4,545,052, Cl. 370-68.000.
Tihanyi, George, 4,544,823, Cl. 219-121.0PK.

Norton, Peter. Multiple displacement hydraulic pump system with automatic displacement control for brake boosters and the like. 4,543,789, Cl. 60-545.000.

Nose, Noriyuki; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Device for measuring light incident on an optical system. 4,544,269, Cl. 356-222.000.

Nubel, Philip O.: *See*—
Brown, Theodore L.; and Nubel, Philip O., 4,544,789, Cl. 585-511.000.

Nuerrenbach, Axel: *See*—
Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel, 4,544,758, Cl. 549-407.000.

NUKEM GmbH: *See*—
Hewig, Gert, 4,544,797, Cl. 136-249.000.

Nukii, Takashi: *See*—
Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, 4,544,989, Cl. 361-401.000.

Numata, Seiiti: *See*—
Muraki, Ryoji; Numata, Seiiti; and Hayashi, Kanji, 4,545,009, Cl. 364-164.000.

Nunokawa, Kazuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Ophathalmoscopic camera having a focus detecting system. 4,544,248, Cl. 354-62.000.

Oberrauch, Ermanno; and Eberson, Lennard, to Anic S.p.A. Electrochemical process for the synthesis of organic compounds. 4,544,450, Cl. 204-59.00R.

Obolewicz, Paul T.: *See*—
Peer, Albert D., Jr.; and Obolewicz, Paul T., 4,544,597, Cl. 428-182.000.

O'Boyle, Matthew, to Windsor Medical, Inc. Peristaltic pump having a spiral cam and straight peristaltic tube. 4,544,329, Cl. 417-53.000.

O'Brien, Jay P.: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.

O'Brien, Robert P., to Calgon Corporation. Air stripping/adsorption process for removing organics from water. 4,544,488, Cl. 210-664.000.

Oce-Nederland B.V.: *See*—
Dinnissen, Johannes H. A., 4,544,147, Cl. 271-35.000.

Ochiai, Akira; and Suzuki, Yoshitaka, to Nissan Motor Company, Limited. Automotive vehicle with front and rear sliding doors. 4,544,198, Cl. 296-155.000.

Ochs, Leonard R., to Duval Corporation. Removal of potassium chloride as a complex salt in the hydrometallurgical production of copper. 4,544,460, Cl. 204-107.000.

Ochsner, Paul A., to Givaudan Corporation. Odorant oximes. 4,544,714, Cl. 252-522.00R.

O'Connell, Peter M., to O'Connell, Peter M. Structured meat product. 4,544,560, Cl. 426-104.000.

O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., to Olin Corporation. Modified polyurethane liquid polymer compositions. 4,544,730, Cl. 528-78.000.

Oda, Hiroyuki: *See*—
Hitomi, Mitsuo; and Oda, Hiroyuki, 4,543,931, Cl. 123-308.000.

Odaka, Kentaro, to Sony Corporation. High-speed recording and reproducing of signals. 4,544,958, Cl. 360-8.000.

Ode, Sadao; Hatsuse, Toshikazu; and Shiina, Hiroshi, to Citizen Watch Co., Ltd. Clasp for ornaments. 4,543,692, Cl. 24-616.000.

Oetting, Hermann; Heidemeyer, Paulus; and Zimmermann, Frank, to Volkswagenwerk Aktiengesellschaft. Method for operating a vehicle having an automatic, continuously variable gear ratio transmission. 4,543,855, Cl. 74-859.000.

Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See*—
Taillet, Joseph; and Larigaldie, Serge, 4,544,382, Cl. 55-107.000.

Ogasawara, Takaaki: *See*—
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.

Ogata, Haruki, to Victor Company of Japan, Ltd. Adapter for a miniature type tape cassette. 4,544,970, Cl. 360-94.000.

Ogawa, Junji: *See*—
Nakano, Tomio; Nakano, Masao; and Ogawa, Junji, 4,545,037, Cl. 365-205.000.

Ogawa, Masahide: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.

Oguchi, Shigemitsu: *See*—
Kogure, Kenji; Kakizaki, Takao; Mitsuya, Yasunaga; Oguchi, Shigemitsu; and Otani, Koji, 4,544,972, Cl. 360-105.000.

Oguchi, Tetsuji, to Nippon Electric Co., Inc. Information processing apparatus. 4,545,014, Cl. 364-200.000.

Oguchi, Yutaka: *See*—
Kojima, Ichiro; Komiya, Kouji; Sato, Hiroshi; and Oguchi, Yutaka, 4,544,633, Cl. 435-86.000.

Ohara, Shunji: *See*—
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,545,044, Cl. 369-32.000.

Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, to Sumitomo Chemical Co., Ltd. Preparation of optically active cis-1,3-dibenzyl-hexahydro-1H-furo[3,4-d]imidazole-2,4-dione and its intermediates. 4,544,635, Cl. 435-121.000.

Ohki, Kouichi: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,545,070, Cl. 382-48.000.

Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Shimizu, Yoshiki, to Daikin Kogyo Co., Ltd. Fluorine-containing copolymer. 4,544,720, Cl. 526-247.000.

Ohno, John M., to General Electric Co. Automatic composite press technique for producing cutting inserts. 4,544,517, Cl. 264-113.000.

Ohno, Yoshio; Koyama, Katsuhiko; and Nishio, Kohsaku, to Photron Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Stereoscopic projecting apparatus. 4,544,247, Cl. 352-62.000.

Ohshima, Jiro: *See*—
Ito, Toshiyo; and Ohshima, Jiro, 4,543,707, Cl. 29-578.000.

Ohta, Kenji; Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; and Yamaoka, Hideyoshi, to Shap Kabushiki Kaisha. Method for manufacturing an optical memory element. 4,544,443, Cl. 156-643.000.

Ohta, Tomohisa: *See*—
Dobashi, Akihiko; Ohta, Tomohisa; Himori, Hirotsugu; and Sekine, Hideo, 4,544,573, Cl. 427-44.000.

Ohtsu, Masamitsu: *See*—
Taniguchi, Hiroshi; Ohtsu, Masamitsu; and Kubo, Kanji, 4,544,966, Cl. 360-75.000.

Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Charging and exposure section in an electrophotographic apparatus. 4,544,261, Cl. 355-3.0CH.

Oishi, Kengo; and Moriwaki, Masayoshi, to Fuji Photo Film Co., Ltd. Pad assembly for tape cassette. 4,544,975, Cl. 360-130.330.

Oishi, Kengo; Komiyama, Choji; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Pad provided in the interior of a videotape cassette. 4,544,976, Cl. 360-132.000.

Oka, Akio: *See*—
Torigai, Katsumi; and Oka, Akio, 4,543,921, Cl. 123-73.00A.

Oka, Hiroshi, to Kohjin Co., Ltd. Method for separation of solid mixtures by simultaneous multi-stage recrystallization. 4,544,391, Cl. 62-541.000.

Okado, Hideo; Hashimoto, Kazuo; Kawamura, Kichinari; Yamazaki, Yasuyoshi; and Takaya, Haruo, to Director-General of Agency of Industrial Science and Technology. Crystalline zeolite, method of preparing same and process for the production of olefins using same as catalyst. 4,544,793, Cl. 585-640.000.

Okamoto, Hideho; and Nishio, Ken-ichi, to Sumitomo Chemical Co., Ltd. Heat-resistant spring made of fiber-reinforced metallic composite material. 4,544,610, Cl. 428-611.000.

Okamoto, Shigemi: *See*—
Yamada, Kaneo; Okamoto, Shigemi; and Asada, Kazuhiko, 4,544,514, Cl. 261-153.000.

Okamura, Masaru: *See*—
Yamada, Takeo; Uesugi, Mitsuaki; and Okamura, Masaru, 4,544,268, Cl. 356-394.000.

Okazaki, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Diagnostic X-ray apparatus. 4,544,948, Cl. 358-111.000.

Okazaki, Masaki: *See*—
Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, 4,544,628, Cl. 430-572.000.

Oki Electric Industry Co., Ltd.: *See*—
Kikuchi, Hiroshi; and Sato, Kenji, 4,543,884, Cl. 101-93.040.

Okimura, Lucy: *See*—
Baunach, Steven C.; Riley, James A.; and Okimura, Lucy, 4,545,015, Cl. 364-200.000.

Okuda, Kanemasa: *See*—
Nomura, Yoshiyuki; Okuda, Kanemasa; and Ishii, Hisao, 4,544,819, Cl. 219-69.00W.

Okutu, Toshimitu: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,544,601, Cl. 428-330.000.

Olin Corporation: *See*—
Kadija, Igor V., 4,544,474, Cl. 204-295.000.
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,544,730, Cl. 528-78.000.
Pryor, Michael J., 4,544,463, Cl. 204-146.000.

Oliver, Oscar, Sr.: *See*—
Posluszny, Thomas; and Oliver, Oscar, Sr., 4,545,027, Cl. 364-724.000.

Ollinger, Janet: *See*—
Smolanoff, Joel R.; Fitzpatrick, J. Michael; and Ollinger, Janet, 4,544,553, Cl. 514-92.000.

Olmsted, Daniel C.; and Kroll, Quin D., to Dover Corporation. Liquid level control having improved instrument air valve. 4,543,979, Cl. 137-315.000.

Olsbergs Hydraulic AB: *See*—
Henriksson, Goran, 4,543,874, Cl. 91-387.000.

Olson, Elwyn H.: *See*—
Dietiker, Paul; Kim, Yong C.; Nelson, Marvin D.; and Olson, Elwyn H., 4,543,974, Cl. 137-66.000.

Olson, Peter K.: *See*—
Kwech, Horst; and Olson, Peter K., 4,543,861, Cl. 82-4.00C.

Olympus Optical Co., Ltd.: *See*—
Endo, Itaru, 4,544,236, Cl. 350-247.000.
Musha, Toru; and Ito, Kenichi, 4,544,838, Cl. 250-202.000.

Omatoi, Susumu: *See*—
Miyazaki, Tomohiro; Tanaka, Hitoshi; Matsumoto, Goro; Matsuhisa, Noboru; and Omatoi, Susumu, 4,544,605, Cl. 428-404.000.

Omega SA: *See—*
Geiger, Michel; Gagnebin, Gaston; and Ackermann, Jacques, 4,544,284, Cl. 368-294.000.

Omnithruster, Inc.: *See—*
Aker, Charles M., 4,543,900, Cl. 114-40.000.

Ono, Kinichi: *See—*
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.

Onoda Cement Co., Ltd.: *See—*
Take, Takao; Kaneko, Katuaki; and Otozaki, Sigeo, 4,544,424, Cl. 156-39.000.

Ontario Die Company Limited: *See—*
Levene, Martin M.; and Lessard, William W., 4,543,862, Cl. 83-19.000.

Oral Ease Inc.: *See—*
Rosofsky, Paul M.; and Blumenfeld, Alfred M., 4,543,679, Cl. 15-110.000.

Oronzio de Nora S.A.: *See—*
Bianchi, Giuseppe; Mussinelli, Gianluigi; and Faita, Giuseppe, 4,544,464, Cl. 204-147.000.

O'Rourke, Michael J.: *See—*
Nagy, Louis L.; and O'Rourke, Michael J., 4,543,823, Cl. 73-304.00C.
Nagy, Louis L.; and O'Rourke, Michael J., 4,544,880, Cl. 324-58.50R.

Ortho Pharmaceutical Corporation: *See—*
Pasquale, Samuel A., 4,544,554, Cl. 424-238.000.

Osada, Michio: *See—*
Bandoh, Kazuo; and Osada, Michio, 4,543,684, Cl. 15-309.000.

Osawa, Michitaka; Funada, Etuo; Miyajima, Hiroyuki; Maekawa, Hitoshi; and Ando, Kunio, to Hitachi, Ltd. Amplitude adjusting equipment in a signal translation line. 4,544,896, Cl. 330-284.000.

Oshima, Yujiro: *See—*
Kataoka, Masao; Oshima, Yujiro; Noda, Takashi; and Suzuki, Shigeo, 4,543,929, Cl. 123-263.000.

Osterburg, Gunther; and Prezelj, Milan, to Deutsche Texaco Aktiengesellschaft. Process for separating methanol from the reaction products obtained in the etherification of C_4 through C_7 isoolefins with methanol. 4,544,776, Cl. 568-697.000.

Osterloh, Rolf: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,544,687, Cl. 523-414.000.

O'Sullivan, Donncha. Pharmaceutical composition and method of treating psoriasis. 4,544,656, Cl. 514-228.000.

O'Sullivan, William T.; and Pace, Earl C., to Westinghouse Electric Corp. Apparatus and process for heat treatment. 4,543,891, Cl. 110-185.000.

Oswald, Hendrikus J.: *See—*
Li, Hsin L.; and Oswald, Hendrikus J., 4,544,594, Cl. 428-92.000.

Otani, Koji: *See—*
Kogure, Kenji; Kakizaki, Takao; Mitsuya, Yasunaga; Oguchi, Shigemitsu; and Otani, Koji, 4,544,972, Cl. 360-105.000.

Otis Elevator Company: *See—*
Salihi, Jalal T.; and Duckworth, James J., 4,544,873, Cl. 318-801.000.

Otozaki, Sigeo: *See—*
Take, Takao; Kaneko, Katuaki; and Otozaki, Sigeo, 4,544,424, Cl. 156-39.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Shono, Tatsuya, 4,544,766, Cl. 560-75.000.

Otsuka Pharmaceutical Company, Limited: *See—*
Ishikawa, Hiroshi; Tabasa, Fujio; and Nakagawa, Kazuyuki, 4,544,747, Cl. 546-156.000.

Otterbein, Roy T., to Arvin Industries, Inc. Combination direct and indirect evaporative media. 4,544,513, Cl. 261-153.000.

Otvos, Laszlo : *See—*
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.

Ovshinsky, Stanford R.; and Sapru, Krishna, to Energy Conversion Devices, Inc. Catalytic electrolytic electrode. 4,544,473, Cl. 204-292.000.

Owada, Fumio; and Yamaguchi, Yoshiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Driving circuit for an electrostatic recording head. 4,544,934, Cl. 346-154.000.

Owen, Hartley: *See—*
Daviduk, Nicholas; Owen, Hartley; and Wright, Bernard S., 4,544,788, Cl. 585-501.000.

Owens-Corning Fiberglas Corporation: *See—*
Bilen, Roger J., 4,544,393, Cl. 65-6.000.

Owens-Corning Fiberglass Corporation: *See—*
Sheinkop, Isac M., 4,544,392, Cl. 65-1.000.

Owens-Illinois, Inc.: *See—*
Allen, Frederick C., 4,544,194, Cl. 294-87.200.

Oy Wartsila Ab: *See—*
Tyynela, Esko; and Pitkanen, Tuomo, 4,544,310, Cl. 409-82.000.

Ozawa, Kazuo; and Sawa, Tetsuo, to Sony Corporation. Magnetic disc device. 4,544,977, Cl. 360-133.000.

Ozone, Toshio: *See—*
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,544,406, Cl. 75-123.00N.

Paar, Willibald; and Schipfer, Rudolf, to Vianova Kunstharz, A.G. Hardening components for paint binders. 4,544,715, Cl. 525-528.000.

Pace, Earl C.: *See—*
O'Sullivan, William T.; and Pace, Earl C., 4,543,891, Cl. 110-185.000.

Pack, Isak; Veintraub, David; Yarkoni, Abraham; and Merchuk, Josef, to Ben-Gurion University of The Negev Research and Development Authority. Method and device for measuring intrauterine pressure. 4,543,965, Cl. 128-748.000.

Paffhausen, Hans: *See—*
Kohle, Ulrich; and Paffhausen, Hans, 4,544,292, Cl. 400-241.200.

Page, Daniel A. Tool carrier with refrigeration compartment. 4,543,798, Cl. 62-239.000.

Painton, Richard C., to Eastman Kodak Company. Servomechanism for disc player. 4,544,969, Cl. 360-78.000.

Pako Corporation: *See—*
Jensen, Gerald A.; and Euteneuer, Charles L., 4,543,771, Cl. 53-520.000.

Palmer, Willard, to Rock-Tenn Company. Cross partition interlock using enlarged tab. 4,544,092, Cl. 229-15.000.

Palmer, William B., to TRW Inc. Fluid coupling assembly. 4,543,992, Cl. 137-614.000.

Pandit, Vijay: *See—*
Stern, Mark; Airesman, Charles; and Pandit, Vijay, 4,543,837, Cl. 73-862.630.

Pantke, Hellmuth: *See—*
Heise, Klaus-Peter; Kuth, Robert; Neufang, Karl; Pantke, Hellmuth; and Wedemeyer, Karlfried, 4,544,372, Cl. 8-602.000.

Papandrea, James J.; and Wenger, John L., to Papandrea, James J. Retractable cable lock. 4,543,806, Cl. 70-30.000.

Papst-Motoren GmbH & Co. KG: *See—*
Moosmann, Helmut; and Muller, Rolf, 4,544,852, Cl. 307-519.000.

Paranjpe, Suresh C., to Mead Corporation, The. Ink jet printer with secondary, cyclically varying deflection field. 4,544,930, Cl. 346-75.000.

Pardoe, Raymond. Shear apparatus. 4,543,719, Cl. 30-134.000.

Park, Kyong; and Kavli, Tom O., to Kavlico Corporation. Variable current transducer system. 4,544,875, Cl. 323-280.000.

Parker, Barry R.: *See—*
Angle, Christopher P.; and Parker, Barry R., 4,544,192, Cl. 292-341.180.

Parker, Dane K., to Goodyear Tire & Rubber Company, The. Polymer bound aryl substituted crown ethers. 4,544,710, Cl. 525-332.200.

Parker-Hannifin Corporation: *See—*
Johnson, Lyle R.; and Herzan, Eugene H., 4,543,994, Cl. 137-614.040.

Parkinson, Dean B., to Computer Identification Systems. Identification card with a radiant energy reactive coating. 4,544,183, Cl. 283-85.000.

Parma Corporation: *See—*
Rogers, Walter C., Jr., 4,544,201, Cl. 297-271.000.

Parrens, Pierre: *See—*
Jeuch, Pierre; Lazzari, Jean-Pierre; and Parrens, Pierre, 4,544,445, Cl. 156-643.000.

Particulate Instruments: *See—*
Berndt, Dale F., 4,544,273, Cl. 356-434.000.

Partyka, Edward S., to Reynolds Metals Company. Can end divider. 4,544,314, Cl. 413-26.000.

Parzefall, Walter; Pflugner, Wolfgang; and Steinberger, Wolfgang, to INA Walzlager Schaeffler KG. Linear rolling bearing for rectangular bar. 4,544,212, Cl. 308-6.00R.

Pasquale, Samuel A., to Ortho Pharmaceutical Corporation. Triphasic oral contraceptive. 4,544,554, Cl. 424-238.000.

Patel, Arvind D., to Dresser Industries, Inc. Zwiterionic 2-alkyl imidazolines as emulsifying agents for oil based drilling fluids. 4,544,756, Cl. 548-354.000.

Patel, Jayantilal, to Loral Corporation. Error analyzer for data communicated by bus protocol. 4,545,055, Cl. 371-55.000.

Patel, Jitendra G.: *See—*
Rehmat, Amirali G.; and Patel, Jitendra G., 4,544,375, Cl. 48-197.00R.

Patrick, Hugh. Turbo-ram-jet engine. 4,543,785, Cl. 60-263.000.

Paul Wurth, S.A.: *See—*
Cooper, Arthur; and Mailliet, Pierre, 4,544,143, Cl. 266-273.000.

Pauliukonis, Richard S. O-ring solenoid water valves. 4,543,983, Cl. 137-356.000.

Paust, Joachim: *See—*
Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel, 4,544,758, Cl. 549-407.000.

Peacock, Peter R. Foldable easel. 4,544,123, Cl. 248-460.000.

Peer, Albert D., Jr.; and Obolewicz, Paul T., to Adolph Coors Company. Corrugated paper board and its method of manufacture. 4,544,597, Cl. 428-182.000.

Peinsipp, Alice A.: *See—*
Rasmussen, Russell G.; Peinsipp, Alice A.; and Breslow, Jeffrey D., 4,544,156, Cl. 273-5.00A.

Pelikan AG: *See—*
Kohle, Ulrich; and Paffhausen, Hans, 4,544,292, Cl. 400-241.200.

Pellegrini, Armando P. Process for preparing carbohydrates from vegetal juice. 4,544,558, Cl. 426-48.000.

Pelloski, Peter E., to Depor Industries. Black corrosion resistant coating and method for a metal substrate. 4,544,581, Cl. 427-383.700.

Penn Virginia Corporation: *See—*
Hahn, William F.; McAdams, Hiramie T.; and Talley, Robert L., 4,544,101, Cl. 241-24.000.
Hahn, William F.; and McAdams, Hiramie T., 4,544,102, Cl. 241-24.000.

Penner, Wayne A.: *See—*
Baggett, Gary P.; Peterson, Robert D.; and Penner, Wayne A., 4,545,026, Cl. 364-724.000.
Pennwalt Corporation: *See—*
Miller, Walter J., 4,544,571, Cl. 427-40.000.
Pentron Corporation: *See—*
Waknine, Samuel, 4,544,359, Cl. 433-199.000.
Pepsico, Inc.: *See—*
Ariel, Gideon B., 4,544,154, Cl. 272-129.000.
Peredy nee Kajtar, Maria: *See—*
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 4,544,044, Cl. 180-227.000.
Perkins, Jeffrey T.: *See—*
Mullins, Phillip L.; Neal, James G.; and Perkins, Jeffrey T., 4,544,579, Cl. 427-175.000.
Perlman, Michael E.: *See—*
Bardos, Thomas J.; Perlman, Michael E.; and MacDiarmid, Joan E., 4,544,501, Cl. 260-239.0EP.
Pernick, Benjamin J., to Grumman Aerospace Corporation. Signal device employing photorefractive area modulation. 4,544,898, Cl. 332-7.510.
Perry, Leroy R., Jr.: *See—*
Wallenbrock, Craig; and Perry, Leroy R., Jr., 4,544,155, Cl. 272-136.000.
Personal Products Company: *See—*
Holtman, Dennis C., 4,544,596, Cl. 428-171.000.
Peters, Bernd: *See—*
Weirich, Walter; and Peters, Bernd, 4,544,185, Cl. 285-137.00R.
Peters, Carl H.: *See—*
Anderson, Thomas W.; Milczarek, Richard J.; and Peters, Carl H., 4,545,043, Cl. 369-32.000.
Peterseim, Heinz; and Leutz, Walter, to Mannesmann AG. Discharge of top gases from blast furnaces or the like. 4,544,138, Cl. 266-44.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 1-Cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-(alkyl-1-piperazinyl)quinoline-3-carboxylic acids, processes for their preparation and antibacterial agents containing them. 4,544,658, Cl. 514-254.000.
Peterson, John I., to United States of America, Health & Human Services. Method of joining plastic optical fibers and connections obtained. 4,544,231, Cl. 350-96.150.
Peterson, Robert D.: *See—*
Baggett, Gary P.; Peterson, Robert D.; and Penner, Wayne A., 4,545,026, Cl. 364-724.000.
Petrizzi, Jeffrey M.: *See—*
Trayford, Charles, III; and Petrizzi, Jeffrey M., 4,544,386, Cl. 55-270.000.
Petrolite Corporation: *See—*
Naiman, Michael I.; and Schield, John A., 4,544,712, Cl. 525-356.000.
Petschauer, Franz: *See—*
Pinter, Reinhard; Petschauer, Franz; and Sbaschnigg, Johann, 4,544,447, Cl. 162-300.000.
Pfeiffer, Hans C.: *See—*
Langner, Gunther O.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,544,846, Cl. 250-396.0ML.
Pfeiffer, Martin: *See—*
Schmidt, Manfred; Trube, Hans; and Pfeiffer, Martin, 4,544,197, Cl. 296-84.00R.
Pfister, Gustav: *See—*
Troup, Alan; Strassler, Sigfrid; Guttinger, Hannes; and Pfister, Gustav, 4,543,815, Cl. 73-28.000.
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, to Hoffmann-La Roche Inc. Antiinflammatory, analgesic, and antirheumatic 4-hydroxy-2-methyl-n-(2-pyridyl)-6-trifluoromethyl-2H-thieno[2,3-e]-1,2-thiazine-3-carboxamide 1,1-dioxide, corresponding compositions, and 3-carboxylic acid lower alkyl ester intermediates. 4,544,655, Cl. 514-222.000.
Pflugner, Wolfgang: *See—*
Parzefall, Walter; Pflugner, Wolfgang; and Steinberger, Wolfgang, 4,544,212, Cl. 308-6.00R.
Pham van Cang, Luc, to Thomson-CSF. Correction control device and a system for automatic establishment of correction data for a television camera. 4,544,952, Cl. 358-210.000.
Philipp, Clemens: *See—*
Figge, Dieter; Siemer, Hans; Artz, Gerd; and Philipp, Clemens, 4,544,018, Cl. 164-481.000.
Phillips, Barry A.: *See—*
Tideswell, Richard B.; Nodelman, Neil H.; and Phillips, Barry A., 4,544,679, Cl. 521-116.000.
Phillips, Bobby M., to Eastman Kodak Company. Low friction drafting system for yarns. 4,543,697, Cl. 28-246.000.
Phillips, Jonathan W., Jr. Ejector and cartridge positioner for revolvers. 4,543,741, Cl. 42-68.000.
Phillips Petroleum Company: *See—*
Cowan, Kiplin D., 4,544,767, Cl. 560-263.000.
Drake, Charles A., 4,544,790, Cl. 585-516.000.
Geibel, Jon F.; Clifflton, Michael D.; and Murtha, Timothy P., 4,544,735, Cl. 528-374.000.
Halliday, Mary M.; and Jackson, Glen R., 4,544,452, Cl. 203-1.000.
Hawley, Gil R., 4,544,716, Cl. 526-119.000.
Hutson, Tom, Jr.; and Hann, Paul D., 4,544,777, Cl. 568-697.000.
Lindstrom, Merlin R., 4,544,466, Cl. 204-159.110.
Walker, John H.; and Wood, Harold V., 4,544,701, Cl. 524-609.000.
Wier, Donald R.; and Gillham, Gordon D., 4,544,206, Cl. 299-4.000.
Wright, Roy F., 4,544,700, Cl. 524-543.000.
Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., 4,544,718, Cl. 526-141.000.
Phillips, R. Daryl: *See—*
Phillips, Robert L.; Phillips, R. Daryl; and Mason, Donald C., 4,543,948, Cl. 128-80.00A.
Phillips, Robert L.; Phillips, R. Daryl; and Mason, Donald C. Apparatus and method for applying rotational pressure to parts of the body. 4,543,948, Cl. 128-80.00A.
Photron Ltd.: *See—*
Ohno, Yoshio; Koyama, Katsuhiko; and Nishio, Kohsaku, 4,544,247, Cl. 352-62.000.
Phuc, Tran N., to Senko Medical Instrument Mfg. Co., Ltd. Respirator with two jet gas injection tubes. 4,543,951, Cl. 128-204.250.
Phyton/AG, Inc.: *See—*
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Thirumalachar, Mandayam J. K., 4,544,666, Cl. 514-460.000.
Pick, Rudolph, to Du Pont de Nemours, E. I., and Company. Process for reducing color in poly(tetramethylene ether) glycol. 4,544,774, Cl. 568-617.000.
Pickelman, Dale M.; and Yats, Larry D., to Dow Chemical Company, The. Amphoteric latexes containing pH independent and pH dependent bound charges. 4,544,697, Cl. 524-458.000.
Pierburg GmbH & Co. K.G.: *See—*
Ehrhart, Fritz; Chattopadhay, Asoke; and Schmidt, Karl, 4,543,939, Cl. 123-533.000.
Pietila, Kenneth A.: *See—*
Erickson, Paul R.; and Pietila, Kenneth A., 4,544,490, Cl. 210-713.000.
Pilati, Luciano: *See—*
Belforte, Piero; Bostica, Bruno; Pilati, Luciano; Bovo, Amilcare; and Canato, Luigi, 4,545,051, Cl. 370-66.000.
Pilkington Brothers Limited: *See—*
Evans, Brian, 4,544,395, Cl. 65-60.300.
Pinkerton, Thomas C.; and Hagestam, Helene I., to Purdue Research Foundation. Chromatographic method and means. 4,544,485, Cl. 210-502.100.
Pinsky, Naum: *See—*
Venkatesan, Srinivasan; Pinsky, Naum; and Sapru, Krishna, 4,544,461, Cl. 204-128.000.
Pinter, Reinhard; Petschauer, Franz; and Sbaschnigg, Johann, to Maschinenfabrik Andritz Actiengesellschaft. Dehydration machine for pulp, sludges or similar fibrous materials. 4,544,447, Cl. 162-300.000.
Pioneer Electronic Corporation: *See—*
Hirano, Hiroyuki; and Matsumoto, Keiichi, 4,544,872, Cl. 318-632.000.
Hirano, Hiroyuki; Kurihara, Toshihiko; Akiba, Taichi; and Araki, Yositsugu, 4,545,003, Cl. 369-43.000.
Tanaka, Megumi; and Naito, Ryuichi, 4,544,837, Cl. 250-201.000.
Piracha, Imtiaz: *See—*
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,011, Cl. 364-200.000.
Lyon, David L.; Huettner, Robert E.; Holsinger, Jerry L.; Falkenstein, Don I.; Piracha, Imtiaz; and Ching, Dennis T., 4,545,013, Cl. 364-200.000.
Pitkanen, Tuomo: *See—*
Tyynela, Esko; and Pitkanen, Tuomo, 4,544,310, Cl. 409-82.000.
Pitney Bowes Inc.: *See—*
Baunach, Steven C.; Riley, James A.; and Okimura, Lucy, 4,545,015, Cl. 364-200.000.
Irvine, Robert; Luperti, Harry E.; and Bayliss, Keith, 4,544,150, Cl. 271-145.000.
Pittaway, James W., to Unisen, Inc. Electronic control circuit for bi-directional motion. 4,544,869, Cl. 318-293.000.
Pittway Corporation: *See—*
Grant, John T., 4,544,903, Cl. 335-205.000.
Plantureux, Alain, to Chancel, Jean-Louis. Setting for a precious stone and a method of mounting the stone in the setting. 4,543,698, Cl. 29-10.000.
Pliskin, William A.: *See—*
Chu, Wei-Kan; Pliskin, William A.; and Riseman, Jacob, 4,544,576, Cl. 427-82.000.
Plunkett, Robert T.; and Inculet, Ion I., to Nordson Corporation. Electrostatic high voltage isolation system with internal charge generation. 4,544,570, Cl. 427-27.000.
Poa, David S.; and Yao, Neng-Ping, to United States of America, Energy. Secondary battery containing zinc electrode with modified separator and method. 4,544,616, Cl. 429-229.000.
Podobinski, David J., to Consolidation Coal Company. Circuit for the arcless de-energization of a direct current load. 4,544,978, Cl. 361-4.000.
Pogue, Harold D.: *See—*
Zemke, Edward H., deceased; Pogue, Harold D.; Shah, Girish B.; and Bowles, Myron A., 4,544,146, Cl. 270-58.000.
Pokorski, John P.: *See—*
Jarvis, William A.; Kirby, John; Lane, Alan J.; Pokorski, John P.; and Sheffield, Wilbur L., 4,544,296, Cl. 401-73.000.
Polaris Industries, Inc.: *See—*
Ebert, Russell L.; and Hayes, Stanley G., 4,544,170, Cl. 280-21.00R.

Poleshuk, Robert J.: *See—*
Aiello, Richard E.; Moist, Stanford C., Jr.; Poleshuk, Robert J.; and Wildman, Timothy C., 4,544,220, Cl. 339-59.00M.
Poock, Darwin N., to FMC Corporation. External pendant pay-out system with anti-droop control. 4,544,071, Cl. 212-264.000.
Porterfield, Richard; Soth, Henry J.; and Biesecker, Douglas A., to Universal Instruments Corporation. Axial-lead component sequencing and inserting apparatus. 4,543,705, Cl. 29-566.300.
Portmann, Albert, to SODECO - SAIA AG. Multiple key switch. 4,544,815, Cl. 200-50.00C.
Posluszny, Thomas; and Oliver, Oscar, Sr., to United Technologies Corporation. Digital adaptive correlating filter. 4,545,027, Cl. 364-724.000.
Possati, Mario: *See—*
Golinelli, Guido; and Possati, Mario, 4,543,725, Cl. 33-178.00E.
Post Office: *See—*
Bright, David E.; and Jones, Steven K., 4,544,841, Cl. 250-221.000.
Potters, Michel, to Isover Saint-Gobain. Apparatus for forming fiber felts. 4,543,690, Cl. 19-300.000.
Poulain, Guy: *See—*
Dien, Rene; and Poulain, Guy, 4,544,728, Cl. 528-21.000.
Poulouin, Armand. Wheeled devices for carrying sail boards. 4,544,172, Cl. 280-47.13B.
Powell, Jack J.: *See—*
Denman, Stephen A.; and Powell, Jack J., 4,544,136, Cl. 254-323.000.
Powell, Jeffrey M., to Liebert Corporation. Power conditioning system and apparatus. 4,544,877, Cl. 323-308.000.
Powers, Edward A., to Xerox Corporation. Grooved vacuum belt document handling system. 4,544,265, Cl. 355-76.000.
Pozo, Jaime F., to AMSTED Industries Incorporated. Electric furnace refractory roof form. 4,545,058, Cl. 373-73.000.
PPG Industries, Inc.: *See—*
Crandell, Stephen L., 4,543,755, Cl. 52-235.000.
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,544,396, Cl. 65-178.000.
Pradel, Claude: *See—*
Dang Vu, Quang; Pradel, Claude; Euzen, Jean-Paul; and Le Page, Jean-Francois, 4,544,544, Cl. 423-659.000.
Pray, David M., to Trenco, Inc. Empty can counter and limiter. 4,545,062, Cl. 377-6.000.
Prenner, Herbert; and Schroder, Paul, to BBC Brown, Boveri & Company Limited. Gas cooled alternating current machine. 4,544,855, Cl. 310-59.000.
Prestwich, Glenn D., to Research Foundation of State University of New York, The. Reactive pheromone mimics for insect mating disruption. 4,544,504, Cl. 260-408.000.
Prezelj, Milan: *See—*
Osterburg, Gunther; and Prezelj, Milan, 4,544,776, Cl. 568-697.000.
Price, John F.: *See—*
Curulla, Michael V.; Price, John F.; Matzner, Bruce; Brayman, Kenneth W.; and Qurnell, Frank D., 4,544,522, Cl. 376-441.000.
Prince, Leonard D.: *See—*
Wieselman, Alex; and Prince, Leonard D., 4,544,990, Cl. 362-32.000.
Priola, Aldo; Romano, Ugo; and Renzi, Fiorenzo, to Anic S.p.A. Composition based on aliphatic polycarbonates which contain urethan groups and acrylic or metacrylic end groups, to be cross-linked in the presence of radicalic initiators. 4,544,725, Cl. 526-301.000.
Procter & Gamble Company, The: *See—*
Janusz, John M.; Buckwalter, Brian L.; and LaHann, Thomas R., 4,544,668, Cl. 514-563.000.
LaHann, Thomas R.; Janusz, John M.; and Buckwalter, Brian L., 4,544,669, Cl. 514-563.000.
Proni Industries, Inc.: *See—*
Proni, Oscar, 4,544,186, Cl. 285-243.000.
Proni, Oscar, to Proni Industries, Inc. Unitary clamp action fitting. 4,544,186, Cl. 285-243.000.
Provolo, Daniel J., to Stewart-Warner Corporation. Method for attaching wheels to dual wheel casters, including ultrasonic welding. 4,544,425, Cl. 156-73.100.
Pryor, Michael J., to Olin Corporation. Method for producing equiaxed iron or iron alloy particles. 4,544,463, Cl. 204-146.000.
Pugh, Stuart: *See—*
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.
Pullukat, Thomas J.; and Hoff, Raymond E., to Chemplex Company. Olefin polymerization catalyst and method. 4,544,646, Cl. 502-109.000.
Puoti, Francesco. Collapsible arm anchor. 4,543,904, Cl. 114-294.000.
Puratrol, Inc.: *See—*
Arvai, Ernest P., 4,544,483, Cl. 210-316.000.
Purdue Research Foundation: *See—*
Cook, William A.; Fearnot, Neal E.; and Geddes, Leslie A., 4,543,954, Cl. 128-419.0PG.
Pinkerton, Thomas C.; and Hagestam, Helene L., 4,544,485, Cl. 210-502.100.
Purrmann, Robert: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,544,742, Cl. 544-8.000.
Puskaric, Emile: *See—*
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, 4,544,536, Cl. 423-300.000.
Quan, Ronald. Stabilized color television subcarrier regenerator circuit. 4,544,943, Cl. 358-25.000.
Qurnell, Frank D.: *See—*
Curulla, Michael V.; Price, John F.; Matzner, Bruce; Brayman, Kenneth W.; and Qurnell, Frank D., 4,544,522, Cl. 376-441.000.
R.W. Packaging, Ltd.: *See—*
Gibson, William K., 4,544,437, Cl. 156-584.000.
Raamot, Jaan, to AT&T Information Systems Inc. Time slot interchanger. 4,545,053, Cl. 370-68.000.
Rabe, James A.: *See—*
Lee, Chi-Long; and Rabe, James A., 4,544,681, Cl. 521-134.000.
Rabenau, Richard: *See—*
Ryder, Francis E.; and Rabenau, Richard, 4,543,882, Cl. 101-35.000.
Racca, Carlo, to Fiat Ferroviaria Savigliano S.p.A. Sliding double doors, particularly for railway and tramway vehicles. 4,543,746, Cl. 49-118.000.
Racz, Bela: *See—*
Karacsonyi nee Eva Spindler, Belane ; Racz, Bela; Boszormenyi, Istvan; Kiraly, Laszlo ; and Medgyesi, Andras, 4,544,410, Cl. 106-278.000.
Rader, Robert R., to Wirtz Manufacturing Company, Inc. Controlled severing of a continuous web. 4,543,863, Cl. 83-76.000.
Rader, Robert R.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,544,014, Cl. 164-429.000.
Radiometer A/S: *See—*
Eisenhardt, Anne R.; and Jensen, Ole J., 4,544,455, Cl. 204-1.00T.
Radomski, Thomas A.: *See—*
Kade, Alexander; and Radomski, Thomas A., 4,545,004, Cl. 363-63.000.
Ramsey, Maynard, III: *See—*
Medero, Richard; Hood, Rush W.; Apple, Howard P.; and Ramsey, Maynard, III, 4,543,962, Cl. 128-682.000.
Rana, Virendra V. S.: *See—*
Luther, Lars C.; and Rana, Virendra V. S., 4,544,438, Cl. 156-624.000.
Rance, Robert J.: *See—*
Maher, David P.; and Rance, Robert J., 4,545,024, Cl. 364-717.000.
Rand, David, Jr. Anesthetic or antiseptic injecting fish hook. 4,543,742, Cl. 43-43.160.
Rando, Joseph F., to Spectra-Physics, Inc. Scanning method using a rotating prism. 4,544,228, Cl. 350-6.400.
Randolph, Robert W., to ACF Industries, Incorporated. Uncoupling device which complies with AAR specification. 4,544,072, Cl. 213-166.000.
Ransomes, Inc.: *See—*
Bednar, Richard D.; and Hampton, James K., 4,543,850, Cl. 74-512.000.
Rao, Bangaru V. N., to General Motors Corporation. Ferrite-austenite dual phase steel. 4,544,422, Cl. 148-142.000.
Rao, Vemulapalli D. N.; and Wade, Wallace R., to Ford Motor Company. Apparatus for periodically oxidizing particulates collected from exhaust gases. 4,544,388, Cl. 55-282.000.
Rapp, Willard E., to AT&T Technologies, Inc. Technique for inserting connector leads into a circuit board. 4,543,713, Cl. 29-837.000.
Rasmussen Holding A/S: *See—*
Sonneborn, Siegfried; Handel, Manfred; and Mack, Ernst, 4,543,753, Cl. 52-15.000.
Rasmussen, James M., to Cummins-Allison Corporation. Coin sorter apparatus and method utilizing coin thickness as a discriminating parameter. 4,543,969, Cl. 133-3.00A.
Rasmussen, Russell G.; Peinsipp, Alice A.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Toy pool table components. 4,544,156, Cl. 273-5.00A.
Rathel, Dieter: *See—*
Gruber, Reinhold; and Rathel, Dieter, 4,543,943, Cl. 126-350.00R.
Raus, Robert W.; and Stewart, Sam E., to Xerox Corporation. Connector latch. 4,544,225, Cl. 339-91.00R.
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, to Boehringer Mannheim GmbH. Process and reagent for the determination of α-amylase. 4,544,631, Cl. 435-14.000.
Raychem Corporation: *See—*
Siden, Dennis C., 4,544,802, Cl. 174-68.500.
RCA Corporation: *See—*
Altman, Ted N.; and Fedele, Nicola J., 4,544,911, Cl. 340-347.0DA.
Blatter, Harold; and Amaral, Joseph E. S., 4,544,923, Cl. 340-825.690.
Chen, Keming J., 4,544,954, Cl. 358-243.000.
Chin, Danny, 4,544,944, Cl. 358-28.000.
French, Michael P., 4,544,924, Cl. 340-825.690.
Haferl, Peter E., 4,544,864, Cl. 315-393.000.
Kosonocky, Walter F.; and Elabd, Hammam, 4,544,939, Cl. 357-30.000.
Lewis, Henry G., Jr.; and Stiller, Thomas M., 4,544,945, Cl. 358-30.000.
VanBreemen, Bertram, 4,544,946, Cl. 358-60.000.
Reding, Nanette L. Child carrying harness. 4,544,088, Cl. 224-159.000.
Reece Corporation, The: *See—*
Tocchio, Louis A., 4,543,895, Cl. 112-104.000.
Regal International, Inc.: *See—*
Thomerson, Clarence, 4,543,998, Cl. 138-110.000.
Rehmat, Amirali G.; and Patel, Jitendra G., to Institute of Gas Technology. Apparatus and process for controlling fluidized beds. 4,544,375, Cl. 48-197.00R.

Reichhold Chemicals, Incorporated: *See—*
Ladish, Douglas J., 4,544,690, Cl. 524-60.000.

Reilly, Roger D., to Deere & Company. Anti-blowout plate for multi-spindle mower decks. 4,543,773, Cl. 56-13.600.

Reimers, Jochen: *See—*
Neal, Mathew; and Reimers, Jochen, 4,544,853, Cl. 307-530.000.

Reini, Donald N. Log lifter for log splitter. 4,544,008, Cl. 144-193.00A.

Rellick, Joseph R., to Du Pont de Nemours, E. I., and Company. Conductive element metallized with a thick film silver composition. 4,544,611, Cl. 428-673.000.

Renzi, Fiorenzo: *See—*
Priola, Aldo; Romano, Ugo; and Renzi, Fiorenzo, 4,544,725, Cl. 526-301.000.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,543,694, Cl. 24-656.000.

Rerat, Carlos F.: *See—*
Schiele, Edward K.; Manley, Robert V., Jr.; and Rerat, Carlos F., 4,544,403, Cl. 75-0.5AB.

Research Foundation of State University of New York, The: *See—*
Bardos, Thomas J.; Perlman, Michael E.; and MacDiarmid, Joan E., 4,544,501, Cl. 260-239.0EP.
Prestwich, Glenn D., 4,544,504, Cl. 260-408.000.

Resnick, Paul R.: *See—*
Grot, Walther G.; Molnar, Charles J.; and Resnick, Paul R., 4,544,458, Cl. 204-98.000.

Rethati, Csilla: *See—*
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.

Revankar, Ganapathi R.: *See—*
Robins, Roland K.; and Revankar, Ganapathi R., 4,544,741, Cl. 536-27.000.

Reven, Frederick V., to Nalco Chemical Company. Electrode coating and coated electrodes. 4,544,472, Cl. 204-290.00R.

Rexnord Inc.: *See—*
Crandall, Robert E., 4,544,061, Cl. 198-813.000.
Erickson, Paul R.; and Pietila, Kenneth A., 4,544,490, Cl. 210-713.000.

Reynolds, James F.: *See—*
Davis, Paul J.; and Reynolds, James F., 4,544,548, Cl. 424-93.000.

Reynolds, Joseph D.; and Lauer, Ernst H., to Eaton Corporation. Remote master shift control. 4,543,843, Cl. 74-473.00R.

Reynolds Metals Company: *See—*
Partyka, Edward S., 4,544,314, Cl. 413-26.000.

Rhodes, John D.; and Cameron, Richard J., to Agence Spatiale Europeenne. Microwave filter structure. 4,544,901, Cl. 333-212.000.

Rhone-Poulenc Industries: *See—*
Roullet, Gilbert; and Legrand, Pierre, 4,544,698, Cl. 524-503.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Dien, Rene; and Poulain, Guy, 4,544,728, Cl. 528-21.000.

Rice, Ivan G. Annular combustor for gas turbine. 4,543,781, Cl. 60-39.360.

Rice, Thomas K.; and Senta, Therese A., to Minnesota Mining and Manufacturing Company. Receptor-based histamine assay. 4,544,629, Cl. 435-7.000.

Richards, Jimmy L., to Goodyear Tire & Rubber Company, The. Reinforcing element for elastomeric articles and elastomeric articles made. 4,544,603, Cl. 428-371.000.

Richardson, Eugene M., to Continental Emsco Company. Well drilling apparatus or the like with position monitoring system. 4,545,017, Cl. 364-422.000.

Richmond, James M.: *See—*
White, Kenneth B.; Richmond, James M.; and Stanley, Keith D., 4,544,506, Cl. 260-462.00R.

Richter, Ian: *See—*
Choderker, Nathan; Dorman, Carl E.; Richter, Ian; and Driver, Richard, 4,544,058, Cl. 194-102.000.

Rickert, David W., to Storage Technology Partners II. Centering device for interchangeable disk. 4,545,047, Cl. 369-290.000.

Ricoh Company, Ltd.: *See—*
Kobayashi, Hiroshi; Machida, Hazime; and Tanaka, Motoharu, 4,544,602, Cl. 428-336.000.
Sakai, Katsuo, 4,544,935, Cl. 346-155.000.

Riedl, Max J.: *See—*
Kern, Mark T.; Bell, Robert A.; and Riedl, Max J., 4,544,843, Cl. 250-239.000.

Riemer, Jed A.: *See—*
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., 4,544,566, Cl. 426-548.000.

Ries, Donald G.: *See—*
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,544,719, Cl. 526-240.000.
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,544,722, Cl. 526-264.000.

Riley, James A.: *See—*
Baunach, Steven C.; Riley, James A.; and Okimura, Lucy, 4,545,015, Cl. 364-200.000.

Rinaldi, Roger E. Well casing inserting and well bore drilling method and means. 4,544,041, Cl. 175-57.000.

Rinno, Helmut: *See—*
Ehmann, Werner; Homanner, Alfons; and Rinno, Helmut, 4,544,689, Cl. 524-52.000.

Riseman, Jacob: *See—*
Chu, Wei-Kan; Pliskin, William A.; and Riseman, Jacob, 4,544,576, Cl. 427-82.000.

Rivaillier, Jacques: *See—*
Gascuel, Jean-Paul; and Rivaillier, Jacques, 4,545,066, Cl. 382-11.000.

Rivara, Sarah B. S.: *See—*
Swift, Allan W.; and Rivara, Sarah B. S., 4,544,190, Cl. 292-307.00B.

Rizvi, Syed S. H., to Cornell Research Foundation, Inc. Method and apparatus for the accelerated adjustment of water activity of foods and other materials. 4,543,735, Cl. 34-15.000.

Robert Bosch GmbH: *See—*
Kessler, Peter-Jurgen; Mayer, Jurgen; and Weiler, Paul, 4,543,682, Cl. 15-250.420.

Robert Morton DG Limited: *See—*
Wilkinson, Noel R., 4,544,281, Cl. 366-325.000.

Robins, Roland K.; and Revankar, Ganapathi R. Azole dinucleotide compounds and methods for their production. 4,544,741, Cl. 536-27.000.

Robinson, Curtiss W., to Boeing Company, The. Drive mechanism for combined flap-aileron surface. 4,544,118, Cl. 244-225.000.

Roche, Michael F.: *See—*
Kucera, Gene H.; and Roche, Michael F., 4,544,614, Cl. 429-193.000.

Rock, Erich; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge having a spring biased pivoting pressure member. 4,543,686, Cl. 16-288.000.

Rock-Tenn Company: *See—*
Palmer, Willard, 4,544,092, Cl. 229-15.000.

Rockwell International Corporation: *See—*
Spinks, R. Joe, Jr.; Snider, Glenn R.; and Deasy, Richard E., 4,545,059, Cl. 375-1.000.
Stock, William H., 4,543,873, Cl. 89-1.590.

Rockwell-Rimoldi S.p.A.: *See—*
DeSantis, Gennaro, 4,543,896, Cl. 112-162.000.

Roder, Albert: *See—*
Ziegenhorn, Joachim; Roder, Albert; Bartl, Knut; and Wehmeyer, Gunter, 4,544,630, Cl. 435-11.000.

Rodolfo, Almanzor Y. Method for the treatment of diabetes. 4,544,550, Cl. 424-127.000.

Roeder, George K. Piston and valve assembly. 4,544,335, Cl. 417-401.000.

Rofer, David: *See—*
Goodman, David S.; Selvin, Gerald J.; Naus, Hubert W.; Rofer, David; and McNutt, Randy A., 4,544,224, Cl. 339-89.00M.

Rogers, Mark C.: *See—*
Gill, Michael; and Rogers, Mark C., 4,543,946, Cl. 126-438.000.

Rogers, Peter R., to TRW Cam Gears Limited. Method of making valve sleeves. 4,543,813, Cl. 72-356.000.

Rogers, Walter C., Jr., to Parma Corporation. Rocking and recliner chairs. 4,544,201, Cl. 297-271.000.

Rogo, Casimir; and Lenz, Herman N., to Teledyne Industries, Inc. Variable geometry device for turbine compressor outlet. 4,544,325, Cl. 415-150.000.

Rohm and Haas Company: *See—*
Smolanoff, Joel R.; Fitzpatrick, J. Michael; and Ollinger, Janet, 4,544,553, Cl. 514-92.000.

Rohn, Bruce D.: *See—*
Gardner, Robert F.; and Rohn, Bruce D., 4,543,936, Cl. 123-475.000.

Rohr, Albin: *See—*
Skrypek, John P.; Williams, Robert; Dominico, James W.; and Rohr, Albin, 4,543,883, Cl. 101-38.00A.

Rohrer, Helmuth H., to Mosaic King (PTY) Ltd. Support structures. 4,543,759, Cl. 52-475.000.

Rolls-Royce Limited: *See—*
Kirker, Timothy J., 4,543,784, Cl. 60-262.000.

Romano, Ugo: *See—*
Priola, Aldo; Romano, Ugo; and Renzi, Fiorenzo, 4,544,725, Cl. 526-301.000.

Romeo, Frank C.: *See—*
Dunn, Jimmy L.; Gilstrap, Lonnie D.; Land, Ronny L.; and Romeo, Frank C., 4,544,193, Cl. 294-86.400.

Romer, Michael; Krause, Joachim; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Halogenobiphenyl derivatives. 4,544,771, Cl. 568-329.000.

Rommen, Hans: *See—*
Stoy, Erich; and Rommen, Hans, 4,543,810, Cl. 72-245.000.

Root-Lowell Mfg., Co.: *See—*
Collins, Dean E., 4,544,133, Cl. 251-344.000.

Rosati, Luciano: *See—*
Camprincoli, Pierpaolo; Marcaccioli, Enzo; and Rosati, Luciano, 4,544,606, Cl. 428-454.000.

Rose Verpackungsmaschinenfabrik Theegarten: *See—*
Schmitz, Heinz, 4,543,769, Cl. 53-450.000.

Rosin, Michael L.: *See—*
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,544,730, Cl. 528-78.000.

Roskell, Derek: *See—*
Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, 4,544,851, Cl. 307-480.000.

Rosofsky, Paul M.; and Blumenfeld, Alfred M., to Oral Ease Inc. Toothbrush assembly combining a handle with a replaceable brush assembly and a replaceable oral hygiene device. 4,543,679, Cl. 15-110.000.

Ross, Gilbert B.; and Stevens, Theodore E. Cultured onyx products and methods therefor. 4,544,584, Cl. 428-15.000.

Rossi & Catelli S.p.A.: *See*—
Catelli, Camillo, 4,543,879, Cl. 99-472.000.
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, to BASF Aktiengesellschaft. 6-Aryl-4,5-dihydro-3(2H)-pyridazinones, and their use as anti-hypertensive and anti-thrombocyte agents. 4,544,562, Cl. 514-247.000.
Roth, Jan, to AB Volvo. Differential gear mechanism. 4,543,854, Cl. 74-713.000.
Roth, Martin, to CIBA GEIGY Corporation. Photocrosslinkable water-soluble polymers, containing maleimidyl and quaternary ammonium groups process for their preparation and use thereof. 4,544,621, Cl. 430-271.000.
Roullet, Gilbert; and Legrand, Pierre, to Rhone-Poulenc Industries. Polymer coating composition and its use in the manufacture of layered packaging. 4,544,698, Cl. 524-503.000.
Royster, John L. Plant growing chamber. 4,543,744, Cl. 47-17.000.
Rucker, Hal. Liquid container. 4,544,077, Cl. 220-449.000.
Rudik, William J.; Schmitt, George P.; and Shipley, John F., to International Business Machines Corporation. Circuit board including multiple wire photosensitive adhesive. 4,544,801, Cl. 174-68.500.
Rudolph, Joachim, to Werner and Pfleiderer. Apparatus for mixing and proportioning several mixing components. 4,544,279, Cl. 366-132.000.
Ruf, Max, to Audi Nsu Auto Union Aktiengesellschaft. Light-alloy cylinder head for reciprocating piston internal combustion engines. 4,543,925, Cl. 123-188.00S.
Runkle, Dean E., to Allied Corporation. Mechanical actuator for a disc brake. 4,544,045, Cl. 188-72.600.
Runzi, Kurt. Sheet supply apparatus for typewriters, having slewing rollers engaging a platen roll, and method. 4,544,294, Cl. 400-636.200.
Rupp, Guenter, to Siemens Aktiengesellschaft. Apparatus for extracting magnetizable particles from a fluid medium. 4,544,482, Cl. 210-222.000.
Russo, Gene W.: *See*—
Iadarola, Ralph E.; Strassle, Warren F.; and Russo, Gene W., 4,543,715, Cl. 29-852.000.
Ruyters, Wilhelmus N.: *See*—
van Berkel, Johannes; and Ruyters, Wilhelmus N., 4,544,510, Cl. 260-465.00D.
Ryan, Patrick J.; Davis, Michael A.; and Melchior, Donald L., to Trustees University of Massachusetts. Liposomes containing modified cholesterol for organ targeting. 4,544,545, Cl. 424-1.100.
Ryden, David M. Remotely operated chimney cleaning apparatus. 4,543,681, Cl. 15-163.000.
Ryder, Francis E.; and Rabenau, Richard. Contact lens marking fixture. 4,543,882, Cl. 101-35.000.
S. A. des Etablissements Staubli (France): *See*—
Bourgeaux, Pierre F. X., 4,544,000, Cl. 139-66.00R.
S. T. Dupont: *See*—
Grossiord, Claude R., 4,544,297, Cl. 401-217.000.
Sabel, Gustav, to Ford Motor Company. Shifting device for a transmission. 4,543,845, Cl. 74-477.000.
Sagi, Janos: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Sagou, Masakazu, to Sumitomo Chemical Company, Ltd. Process for producing formaldehyde. 4,544,773, Cl. 568-487.000.
Sahara, Hiroshi: *See*—
Watanabe, Toshiaki; Uenishi, Toshifumi; Sahara, Hiroshi; and Yamaoka, Katsumi, 4,544,922, Cl. 340-728.000.
Saijo, Yoshiaki: *See*—
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,543,970, Cl. 134-62.000.
Saiko, Alfons: *See*—
Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons, 4,543,886, Cl. 104-53.000.
Saito, Jun: *See*—
Ema, Kenji; Saito, Jun; Mitsuishi, Takatoshi; and Ikado, Shuhei, 4,544,727, Cl. 526-313.000.
Saito, Yutaka: *See*—
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.
Saitoh, Koichi: *See*—
Itami, Teruhiko; Kimoto, Toshifumi; Yamasawa, Akira; and Saitoh, Koichi, 4,544,574, Cl. 427-48.000.
Sakaguchi, Morohira: *See*—
Yoshida, Shigeru; Shiraishi, Norihisa; Asakawa, Chosei; and Sakaguchi, Morohira, 4,544,142, Cl. 266-252.000.
Sakai, Katsuo, to Ricoh Company, Ltd. Recording apparatus. 4,544,935, Cl. 346-155.000.
Sakanaka, Yasuhiro: *See*—
Narui, Mamoru; Nakagawa, Tatsushi; and Sakanaka, Yasuhiro, 4,544,709, Cl. 525-344.000.
Sakazume, Akio: *See*—
Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, 4,544,338, Cl. 418-63.000.
Salas, Edward R.; Fisher, Edwin P.; Johnson, Robert B.; Nibby, Chester M., Jr.; and Boudreau, Daniel A., to Honeywell Information Systems Inc. Memory identification apparatus and method. 4,545,010, Cl. 364-200.000.
Salensky, George A.; and Fry, John S., to Union Carbide Corp. Metal-containing phenolic coating compositions. 4,544,688, Cl. 523-458.000.
Saliger, Kenneth C., to Mobil Oil Corporation. Vertical flowline connector. 4,544,036, Cl. 166-341.000.
Salihi, Jalal T.; and Duckworth, James J., to Otis Elevator Company. Elevator polyphase motor control. 4,544,873, Cl. 318-801.000.
Saltz, Ira M. Luggage utilizing series of fabric-covered battens. 4,544,051, Cl. 190-124.000.
Sanchez Giraldez, Jose H. Pendulum means. 4,544,282, Cl. 368-179.000.
Sanchez, Ignacio O. Process for bending cuts for manufacturing goods of leather or synthetical materials. 4,544,429, Cl. 156-227.000.
Sanders, Gary G.: *See*—
Friedman, Ernest H.; Sanders, Gary G.; and Hunter, Steven L., 4,543,957, Cl. 128-630.000.
Sanders, Georgius B. J.: *See*—
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; and Sanders, Georgius B. J., 4,544,806, Cl. 179-115.5PV.
Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., to Hallmark Cards, Inc. Electrical ornamentation system. 4,544,218, Cl. 339-31.00L.
Sanders, Stephen H., III: *See*—
Clemmons, Richard R.; Zimmer, Darrel E.; and Sanders, Stephen H., III, 4,544,866, Cl. 318-54.000.
Sanderson, Ronald D.; and Badenhorst, Jurchens B., to Ko-Operatiewe Wijnbouers Vereniging Van Zuid-Afrika Beperkt. Surfacing of beverage vessels. 4,544,589, Cl. 428-35.000.
Sandoz, Inc.: *See*—
Manning, Robert E.; and Nadelson, Jeffrey, 4,544,663, Cl. 514-378.000.
Sandoz Ltd.: *See*—
Kaul, Bansi L., 4,544,736, Cl. 534-575.000.
Sandvig, Timothy C.; Ersfeld, Dean A.; and Berg, Eric P., to Minnesota Mining and Manufacturing Company. Coated ophthalmic lenses and method for coating the same. 4,544,572, Cl. 427-44.000.
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., to Eltech Systems Corporation. Dimensionally stable drained aluminum electrowinning cathode method and apparatus. 4,544,457, Cl. 204-67.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Torigai, Katsumi; and Oka, Akio, 4,543,921, Cl. 123-73.00A.
Santa Barbara Research Center: *See*—
Kern, Mark T.; Bell, Robert A.; and Riedl, Max J., 4,544,843, Cl. 250-239.000.
Sapru, Krishna: *See*—
Ovshinsky, Stanford R.; and Sapru, Krishna, 4,544,473, Cl. 204-292.000.
Venkatesan, Srinivasan; Pinsky, Naum; and Sapru, Krishna, 4,544,461, Cl. 204-128.000.
Saroul, Jacques, to Crouzet. Device for testing the insulation of printed circuits. 4,544,881, Cl. 324-73.0PC.
Sasaki, Hiroshi: *See*—
Takubo, Hiroichi; and Sasaki, Hiroshi, 4,543,926, Cl. 123-242.000.
Sasaki, Katutoki: *See*—
Matsutani, Kinya; and Sasaki, Katutoki, 4,543,794, Cl. 62-54.000.
Sasaki, Koji; Yoshida, Eiichi; and Sawaki, Akira. Copying machine having an image density control device. 4,544,263, Cl. 355-14.00E.
Sasaki, Mitsuru; and Ishiguri, Yukio, to Sumitomo Chemical Company, Limited. α-Hydroxyethylphosphinates, and their use as fungicides. 4,544,652, Cl. 514-127.000.
Sasaki, Teruo: *See*—
Tominaga, Ichiro; and Sasaki, Teruo, 4,543,827, Cl. 73-602.000.
Satake Engineering, Co., Ltd.: *See*—
Mitsukawa, Zendo, 4,544,280, Cl. 366-141.000.
Sato, Hiroshi: *See*—
Kojima, Ichiro; Komiya, Kouji; Sato, Hiroshi; and Oguchi, Yutaka, 4,544,633, Cl. 435-86.000.
Sato, Kenji: *See*—
Kikuchi, Hiroshi; and Sato, Kenji, 4,543,884, Cl. 101-93.040.
Sato, Shinichi: *See*—
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,543,970, Cl. 134-62.000.
Sato, Susumu: *See*—
Irie, Toshio; Sato, Susumu; and Hashimoto, Osamu, 4,544,419, Cl. 148-12.00C.
Sato, Tadashi: *See*—
Moriki, Yasumitsu; Sato, Tadashi; Yamamoto, Kazuyoshi; and Takahashi, Izumi, 4,543,818, Cl. 73-49.800.
Sato, Teiji: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, to Matsushita Electric Industrial Company, Limited. Method and apparatus for optically recording and reproducing information. 4,545,044, Cl. 369-32.000.
Satoh Seiki Co., Ltd.: *See*—
Wada, Katsuhiko, 4,543,702, Cl. 29-434.000.
Satomura, Hiroshi: *See*—
Shigenobu, Michio; and Satomura, Hiroshi, 4,544,828, Cl. 219-216.000.
Saurer Diederichs: *See*—
Deborde, Albert H.; and Grandvallet, Gilles, 4,543,999, Cl. 139-1.00C.
Sauter, Josef: *See*—
Zerhoch, Georg; Sauter, Josef; Kiederle, Richard; and von Stein, Gunther, 4,543,739, Cl. 38-15.000.
Savit, Carl H., to Western Geophysical Co. of America. Methods for seismic exploration. 4,545,039, Cl. 367-39.000.

Sawa, Tetsuo: *See*—
Ozawa, Kazuo; and Sawa, Tetsuo, 4,544,977, Cl. 360-133.000.
Sawafuji, Tadashi. Plane speaker. 4,544,805, Cl. 179-115.5PV.
Sawai, Mithio; Tasaka, Yoshihiro; Kawai, Toshikazu; and Katsuhara, Yutaka, to Central Glass Company, Limited. Method of purifying hexafluoroacetone hydrate. 4,544,772, Cl. 568-411.000.
Sawaki, Akira: *See*—
Sasaki, Koji; Yoshida, Eiichi; and Sawaki, Akira, 4,544,263, Cl. 355-14.00E.
Sawamoto, Kunifumi: *See*—
Morita, Tatsuo; and Sawamoto, Kunifumi, 4,543,934, Cl. 123-435.000.
Sawamura, Mamoru, to Dowa Seishi Co., Ltd. Pleat screen. 4,544,011, Cl. 160-84.00R.
Sbaschnigg, Johann: *See*—
Pinter, Reinhard; Petschauer, Franz; and Sbaschnigg, Johann, 4,544,447, Cl. 162-300.000.
Scanding Byggkonsult Aktiebolag: *See*—
Halvorsen, Finn, 4,543,762, Cl. 52-660.000.
Scanlon, John P. Arrow nock. 4,544,163, Cl. 273-416.000.
Scarbrough, Don R.: *See*—
Hastings, Donald R.; Herstek, Glen A.; and Scarbrough, Don R., 4,543,710, Cl. 29-613.000.
Schabowski, John V.: *See*—
Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, 4,544,851, Cl. 307-480.000.
Schaich, Eugen: *See*—
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Schaller, George E., to Ceramic Magnetics, Inc. Positional transducer. 4,544,803, Cl. 178-18.000.
Schaller, Werner, to Siemens Aktiengesellschaft. Cable lead-in for encapsulated electrical equipment. 4,544,221, Cl. 339-60.00M.
Schantl, Joachim: *See*—
Brombacher, Urs; Montavon, Marc; Bretschneider, Hermann; Schantl, Joachim; and Turk, Wolfgang, 4,544,659, Cl. 514-297.000.
Schapel, Dietmar: *See*—
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.
Schauf, Dieter, to Bayer Aktiengesellschaft. Hollow bodies of plastic materials. 4,544,588, Cl. 428-35.000.
Schenk, Raymond L.: *See*—
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,544,014, Cl. 164-429.000.
Schering A.G.: *See*—
Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., 4,544,654, Cl. 514-210.000.
Scheurecker, Werner; Holzer, Karl; Engel, Kurt; and Schubert, Hermann, to Voest-Alpine Aktiengesellschaft. Continuous casting plant. 4,544,015, Cl. 164-442.000.
Schieber, Eberhard: *See*—
Bortfeld, Manfred; Schieber, Eberhard; and Dietzsch, Gunter, 4,543,723, Cl. 30-381.000.
Schield, John A.: *See*—
Naiman, Michael I.; and Schield, John A., 4,544,712, Cl. 525-356.000.
Schiele, Edward K.; Manley, Robert V., Jr.; and Rerat, Carlos F., to Fansteel Inc. High charge, low leakage tantalum powders. 4,544,403, Cl. 75-0.5AB.
Schilke, Waldemar, to Bata Industries Limited. Machine and method for producing footwear. 4,544,519, Cl. 264-328.100.
Schiller, Michael, to Fingermatrix, Inc. Finger identification. 4,544,267, Cl. 356-71.000.
Schimmoller, Frank D.: *See*—
Nizel, Robert N.; and Schimmoller, Frank D., 4,544,214, Cl. 312-209.000.
Schindl, Klaus, to C. Reichert Optische Werke AG. Optical deflecting device. 4,544,242, Cl. 350-486.000.
Schindler, H.-Joachim: *See*—
Diepholz, Tilo; Hapke, Walter; Wohl, Wilhelm; and Schindler, H.-Joachim, 4,544,965, Cl. 360-71.000.
Schindler, Harvey D.: *See*—
Long, Raymond H.; and Schindler, Harvey D., 4,544,476, Cl. 208-8.0LE.
Schipfer, Rudolf: *See*—
Paar, Willibald; and Schipfer, Rudolf, 4,544,715, Cl. 525-528.000.
Schleimer, Stephen I.: *See*—
Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., 4,545,012, Cl. 364-200.000.
Schmale, Gerhard, to Keiper Automobiltechnik GmbH & Co. KG. Back frame for seat, particularly for power vehicle seat. 4,544,204, Cl. 297-452.000.
Schmeichel, Charles M.: *See*—
Schmeichel, Steven C.; and Schmeichel, Charles M., 4,544,196, Cl. 296-26.000.
Schmeichel, Steven C.; and Schmeichel, Charles M. Truck box extension apparatus. 4,544,196, Cl. 296-26.000.
Schmidt, Friedrich, to Bayer Aktiengesellschaft. Process for removal of emission gas pollutants by biological means. 4,544,381, Cl. 55-89.000.
Schmidt, Karl: *See*—
Ehrhart, Fritz; Chattopadhay, Asoke; and Schmidt, Karl, 4,543,939, Cl. 123-533.000.
Schmidt, Manfred; Trube, Hans; and Pfeiffer, Martin, to Daimler-Benz Aktiengesellschaft. Windshield for motor vehicles equipped with a windshield wiper installation. 4,544,197, Cl. 296-84.00R.
Schmidt, Thomas, to Bayer Aktiengesellschaft. Process for preparing 3,4,6-trisubstituted 3-alkylthio-1,2,4-triazin-5-one derivatives. 4,544,744, Cl. 544-182.000.
Schmitt, Eugene W.: *See*—
Allen, Charles S.; Berg, Arthur A.; Schmitt, Eugene W.; Stoltenberg, Michael R.; and Lissau, Frederic, 4,544,132, Cl. 251-318.000.
Schmitt, George P.: *See*—
Rudik, William J.; Schmitt, George P.; and Shipley, John F., 4,544,801, Cl. 174-68.500.
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd. 1,2,6-Thiadiazine-3,5-dione-1,1-dioxides. 4,544,742, Cl. 544-8.000.
Schmitz, Heinz, to Rose Verpackungsmaschinenfabrik Theegarten. Method and apparatus for forming and wrapping objects of a soft mass. 4,543,769, Cl. 53-450.000.
Schmolka, Irving R., to BASF Wyandotte Corporation. High foaming liquid shampoo composition. 4,544,495, Cl. 252-174.210.
Schnellmann, Oscar. Mixer with slotted rotor and cleaner therefor. 4,544,277, Cl. 366-78.000.
Schniederjan, Reinhold, to Hydromatik GmbH. Control apparatus for several drive assemblies consisting of hydrostatic drive units. 4,544,330, Cl. 417-218.000.
Schnurbusch, Horst; and Baltruschat, Helmut, to Chemische Werke Huls Aktiengesellschaft. 4-DL-Alkylester-α-alaninyl-6-chloro-S-triazines and the use thereof as herbicides. 4,544,402, Cl. 71-93.000.
Scholey, Michael F., to Mattel, Inc. Means for joining toy track sections. 4,544,094, Cl. 238-10.00R.
Scholl, Frederick, to Codenoll Technology Corporation. Wavelength-selective photodetector. 4,544,938, Cl. 357-30.000.
Scholl, Herbert: *See*—
Metz, Rudi; and Scholl, Herbert, 4,544,985, Cl. 361-144.000.
Schonert, Robert F. Rotary tiller apparatus and pivotal support structure therefor. 4,544,038, Cl. 172-78.000.
Schonfeld, Harald; and Bauer, Angelo, to Carl Schenck A.G. Procedure for balancing of rotors without journals. 4,543,825, Cl. 73-459.000.
Schreiber, William L.: *See*—
Fujoika, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,544,775, Cl. 568-675.000.
Schreiter, Manfred: *See*—
Walter, Kurt; Gokorsch, Wilfried; Kurth, Gunter; Grusdt, Rainer; and Schreiter, Manfred, 4,543,770, Cl. 53-511.000.
Schroder, Paul: *See*—
Prenner, Herbert; and Schroder, Paul, 4,544,855, Cl. 310-59.000.
Schroeder, Matt. Butter dispenser. 4,544,083, Cl. 222-47.000.
Schroeppel, Edward A., to Cordis Corporation. System for controlling body implantable action device. 4,543,955, Cl. 128-635.000.
Schrotz, Kurt; and Becker, Werner, to Esselte Pendaflex Corporation. Device for intermittently transporting a label bearing tape in a manually operated labeler. 4,544,433, Cl. 156-384.000.
Schubert, Hermann: *See*—
Scheurecker, Werner; Holzer, Karl; Engel, Kurt; and Schubert, Hermann, 4,544,015, Cl. 164-442.000.
Schuiling, Theodorus A.; and Morsing, Gijsbertus B., to Daisy Systems Holland B.V. Apparatus for mounting a daisy wheel in a daisy wheel printer. 4,544,290, Cl. 400-175.000.
Schulten, Rudolf: *See*—
Struck, Bernd-Dieter; Biallas, Bernd; and Schulten, Rudolf, 4,544,459, Cl. 204-103.000.
Schultz, Robert T. Further-improved control system for solar heating systems. 4,543,944, Cl. 126-419.000.
Schumacher, Rolf: *See*—
Zinke, Horst; and Schumacher, Rolf, 4,544,492, Cl. 252-32.70E.
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, to BASF Aktiengesellschaft. Heat-curable surface-coating agents, and their use. 4,544,687, Cl. 523-414.000.
Schuster, Herbert: *See*—
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,544,650, Cl. 502-424.000.
Schuster, John H., to Lockheed Corporation. Leading edge flap and boundary layer control system. 4,544,117, Cl. 244-210.000.
Schutz, Hans U.; and Buhler, Arthur, to Ciba-Geigy Corporation. Fibre-reactive chromium complex Azo-azomethine dyes. 4,544,739, Cl. 534-619.000.
Schwabe, Peter: *See*—
Muller, Peter; Wagner, Kuno; Wegner, Christian; and Schwabe, Peter, 4,544,683, Cl. 523-111.000.
Schwartz, Allan A.: *See*—
Jacoby, George V.; and Schwartz, Allan A., 4,544,963, Cl. 360-40.000.
Schwarzmeier, Karl: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,544,345, Cl. 425-405.00R.
Schwen, Roland, to BASF Aktiengesellschaft. Grinding, lapping, and polishing compounds. 4,544,377, Cl. 51-298.000.
Scott, Julian C., to Westinghouse Electric Corp. Liquid level indicator for a tilted container. 4,543,730, Cl. 33-366.000.

Scripps Clinic and Research Foundation: *See—*
Bittle, James L.; and Lerner, Richard A., 4,544,500, Cl. 260-112.50R.
Scripto, Inc.: *See—*
Jarvis, William A.; Kirby, John; Lane, Alan J.; Pokorski, John P.; and Sheffield, Wilbur L., 4,544,296, Cl. 401-73.000.
Seametrics, Inc.: *See—*
Sorrell, Furman Y.; Curtin, Thomas B.; and Feezor, Michael D., 4,543,822, Cl. 73-170.00A.
Sedlock, Gerald T.: *See—*
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., 4,544,149, Cl. 271-107.000.
Seely, James R., to Marketing Displays, Inc. Sign bracket. 4,544,125, Cl. 248-624.000.
Seffernick, Lewis L.; and Trobridge, Gary W., to CTS Corporation. Machine insertion of circuit module terminals. 4,543,714, Cl. 29-845.000.
Segawa, Makoto: *See—*
Ariizumi, Shoji; and Segawa, Makoto, 4,544,941, Cl. 357-71.000.
Segers, Dennis L., to Mostek Corporation. Sense amplifier with time dependent sensitivity. 4,545,036, Cl. 365-189.000.
Seiffert, Harry: *See—*
Muller, Alfred; and Seiffert, Harry, 4,543,780, Cl. 57-406.000.
Seiki, Kazuo; Suzuki, Yoshihisa; and Yasui, Yoshiharu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for yarn piecing in fasciated yarn spinning unit. 4,543,776, Cl. 57-261.000.
Seilly, Alec H.: *See—*
Best, Christopher H.; and Seilly, Alec H., 4,544,905, Cl. 336-136.000.
Seiver, Robert L.; and Chianelli, Russell R., to Exxon Research and Engineering Co. Supported carbon-containing molybdenum and tungsten sulfide catalysts their preparation and use. 4,544,481, Cl. 208-215.000.
Sekine, Hideo: *See—*
Dobashi, Akihiko; Ohta, Tomohisa; Himori, Hirotsugu; and Sekine, Hideo, 4,544,573, Cl. 427-44.000.
Selenia, Industrie Elettroniche Associate, S.p.A.: *See—*
Giuli, Dino, 4,544,926, Cl. 343-18.00E.
Seligman, Marvin: *See—*
Lowell, Ross; Seligman, Marvin; and Calamai, Edward, 4,544,120, Cl. 248-122.000.
Sells, Paul S. Golfing aid. 4,544,159, Cl. 273-183.00A.
Selvin, Gerald J.: *See—*
Goodman, David S.; Selvin, Gerald J.; Naus, Hubert W.; Rofer, David; and McNutt, Randy A., 4,544,224, Cl. 339-89.00M.
Sencorp: *See—*
Warman, Thomas E.; Baker, Gordon P.; and Smith, James E., 4,544,090, Cl. 227-131.000.
Senko Medical Instrument Mfg. Co., Ltd.: *See—*
Phuc, Tran N., 4,543,951, Cl. 128-204.250.
Senniger Irrigation, Inc.: *See—*
Healy, Mark; and Gerdes, Jerry D., 4,543,985, Cl. 137-505.250.
Senta, Therese A.: *See—*
Rice, Thomas K.; and Senta, Therese A., 4,544,629, Cl. 435-7.000.
Sepponen, Raimo, to Instrumentarium Oy. Diagnosis apparatus and the determination of tissue structure and quality. 4,543,959, Cl. 128-653.000.
Sermatech International Inc.: *See—*
Mosser, Mark F.; and Eddinger, Kevin, 4,544,408, Cl. 106-14.120.
Serrie, Gerard J. J.; and Huvet, Jean-Marie, to Claude, S.A. Domestic power line breaker. 4,544,980, Cl. 361-45.000.
Sers, Gilbert L. Fault detector test instrument. 4,544,807, Cl. 179-175.110.
Sethi, Dalbir S.: *See—*
Lee, Nathan D.; and Sethi, Dalbir S., 4,544,543, Cl. 423-588.000.
Seto, Toru: *See—*
Honda, Mitsuyasu; Hino, Masao; and Seto, Toru, 4,544,525, Cl. 422-171.000.
Seuter, Antonius M. J. H.; and van den Boom, Petrus F. J., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,544,997, Cl. 362-263.000.
Sewell, Robert G. S.: *See—*
Graham, Kenneth J.; and Sewell, Robert G. S., 4,543,872, Cl. 86-1.00B.
Seynhaeve, Andre G., to Societe Delsey. Handle for wheeled suitcase. 4,544,050, Cl. 190-115.000.
Shah, Girish B.: *See—*
Zemke, Edward H., deceased; Pogue, Harold D.; Shah, Girish B.; and Bowles, Myron A., 4,544,146, Cl. 270-58.000.
Shalaby, Shalaby W.; and Koelmel, Donald F., to Ethicon, Inc. Flexible copolymers of p-(hydroxyalkoxy)benozic acid and pliant surgical products, particularly monofilament surgical sutures, therefrom. 4,543,952, Cl. 128-335.500.
Shanks, Bruce E., to General Electric Company. Sealed lamp. 4,544,998, Cl. 362-267.000.
Shap Kabushiki Kaisha: *See—*
Ohta, Kenji; Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,544,443, Cl. 156-643.000.
Shapiro, Wilbur; Graham, Richard W., II; and Anderson, Hugh G., Jr., to United States of America, Navy. Fluid equalized tilting pad thrust bearings. 4,544,285, Cl. 384-99.000.
Sharp Kabushiki Kaisha: *See—*
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Suyama, Takahiro; and Yano, Seiki, 4,545,057, Cl. 372-45.000.
Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, 4,544,989, Cl. 361-401.000.
Nakanishi, Yasuhiro, 4,544,283, Cl. 368-251.000.
Sharp, William G., to Amerock Corporation. Remote window operating system. 4,544,865, Cl. 318-53.000.
Sharp, William J.: *See—*
Simashkevich, Richard M.; and Sharp, William J., 4,544,100, Cl. 239-407.000.
Sharper, Craig A., to AT&T Bell Laboratories. Digital code translator. 4,544,916, Cl. 340-347.0DD.
Sharpless, John, to Nordson Corporation. Exteriorly mounted and positionable spray coating nozzle assembly. 4,543,909, Cl. 118-326.000.
Shaver Manufacturing Co.: *See—*
Helmick, James L., 4,544,176, Cl. 280-481.000.
Shaw Industries Ltd.: *See—*
Stockman, James J., 4,544,426, Cl. 156-73.600.
Sheffield, Wilbur L.: *See—*
Jarvis, William A.; Kirby, John; Lane, Alan J.; Pokorski, John P.; and Sheffield, Wilbur L., 4,544,296, Cl. 401-73.000.
Sheinkop, Isac M., to Owens-Corning Fiberglass Corporation. Apparatus for thermally conditioning heat softenable material. 4,544,392, Cl. 65-1.000.
Shell Internationale Research Maatschappij B.V.: *See—*
van Berkel, Johannes; and Ruyters, Wilhelmus N., 4,544,510, Cl. 260-465.0DD.
Shell Oil Company: *See—*
Corley, Larry S., 4,544,732, Cl. 528-90.000.
Johnson, Paul R., 4,544,137, Cl. 254-337.000.
Wilson, Stanley E., 4,544,780, Cl. 585-377.000.
Shellhause, Ronald L., to General Motors Corporation. Wheel cylinder assembly and seal arrangement therein. 4,544,049, Cl. 188-364.000.
Shepard, Kenneth L.; and Graham, Samuel L., to Merck & Co., Inc. 2-Sulfamoylbenzo[b]furan derivatives for the treatment of elevated intraocular pressure. 4,544,667, Cl. 514-470.000.
Shepherd, John V., to Letraset Limited. Production of artwork. 4,544,430, Cl. 156-235.000.
Sherman, John D.: *See—*
Chao, Chien C.; and Sherman, John D., 4,544,778, Cl. 568-872.000.
Shiba, Kazuo; and Miyashita, Masakazu, to Citizen Watch Co., Ltd. Measuring device for oblique angle. 4,543,724, Cl. 33-1.00N.
Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor. 4,544,331, Cl. 417-269.000.
Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Double acting type compressor. 4,544,332, Cl. 417-269.000.
Shichijo, Hisashi: *See—*
Chatterjee, Pallab; Shichijo, Hisashi; and Leiss, John E., 4,545,034, Cl. 365-182.000.
Shigenobu, Michio; and Satomura, Hiroshi, to Canon Kabushiki Kaisha. Heating device. 4,544,828, Cl. 219-216.000.
Shiina, Hiroshi: *See—*
Ode, Sadao; Hatsuse, Toshikazu; and Shiina, Hiroshi, 4,543,692, Cl. 24-616.000.
Shimadzu Corporation: *See—*
Yamamoto, Hiroshi, 4,544,271, Cl. 356-328.000.
Shimago, Kozo: *See—*
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,544,635, Cl. 435-121.000.
Shimamoto, Akira: *See—*
Matsui, Isamu; Yamamoto, Yoshio; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimamoto, Akira, 4,544,107, Cl. 242-35.50A.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,543,847, Cl. 74-480.00R.
Nakajima, Hideki, 4,544,111, Cl. 242-84.52B.
Shimeki, Yasuharu: *See—*
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, 4,544,962, Cl. 360-40.000.
Shimer, Robert: *See—*
Hidler, Henry; Davey, Ernest; Hope, Lawrence L.; and Shimer, Robert, 4,544,091, Cl. 228-124.000.
Shimizu, Hiroshi; and Mizunuma, Yasuyuki, to NEC Corporation. High electromechanical-coupling coefficient surface acoustic wave device. 4,544,857, Cl. 310-313.00B.
Shimizu, Kazuo: *See—*
Hashimoto, Yasuyuki; and Shimizu, Kazuo, 4,544,295, Cl. 401-65.000.
Shimizu, Makoto, to Tokyo Shibaura Denki Kabushiki. Image information registering/retrieving system. 4,544,956, Cl. 358-296.000.
Shimizu, Noboru: *See—*
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.
Shimizu, Seiichi, to Canon Kabushiki Kaisha. Soft focusing lens assembly. 4,544,240, Cl. 350-429.000.
Shimizu, Shigehisa: *See—*
Kanaoka, Takeshi; and Shimizu, Shigehisa, 4,544,259, Cl. 355-1.000.
Shimizu, Yoshiki: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Shimizu, Yoshiki, 4,544,720, Cl. 526-247.000.
Shinko Denshi Company Limited: *See—*
Nishiguchi, Yuzuru; Uchiyama, Shigeru; and Kobayashi, Masaaki, 4,544,858, Cl. 310-321.000.

Shinko Electric Co., Ltd.: *See*—
Nakanishi, Sadao; Nakajima, Yoshihiro; Kawano, Hitoshi; Ihochi, Akihiko; Ogasawara, Takaaki; and Maruyama, Tokuji, 4,544,826, Cl. 219-137.0PS.

Shinozaki, Fumiaki: *See*—
Takahashi, Yonosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,544,627, Cl. 430-325.000.

Shipley Company Inc.: *See*—
Christensen, Carl W.; and Isaacson, Calvin, 4,544,619, Cl. 430-258.000.

Shipley, John F.: *See*—
Rudik, William J.; Schmitt, George P.; and Shipley, John F., 4,544,801, Cl. 174-68.500.

Shiraishi, Norihisa: *See*—
Yoshida, Shigeru; Shiraishi, Norihisa; Asakawa, Chosei; and Sakaguchi, Morohira, 4,544,142, Cl. 266-252.000.

Shirasaki, Yuichi: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,544,233, Cl. 350-96.200.

Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, to Showa Denko Kabushiki Kaisha; and Hitachi, Ltd. Battery having electrode made of polymeric compound having conjugated double bonds. 4,544,615, Cl. 429-194.000.

Shoji, Saburo: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.

Shone, Michael F.; and Belt, Roger F., to Litton Systems, Inc. Compressed bismuth-containing garnet films of replicable low anisotropy field value and devices utilizing same. 4,544,239, Cl. 350-376.000.

Shono, Tatsuya, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing aryl acetic acid derivatives. 4,544,766, Cl. 560-75.000.

Shore, Brian: *See*—
Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, 4,544,851, Cl. 307-480.000.

Showa Denko Kabushiki Kaisha: *See*—
Shishikura, Toshikazu; Konuma, Hiroshi; Nakamura, Hidenori; and Kobayashi, Yukio, 4,544,615, Cl. 429-194.000.

Shrock, Fred J. Vehicle seat-bed extender. 4,543,675, Cl. 5-37.00R.

Shuler, Lucien B., to Caterpillar Tractor Co. Control system for hydrostatic transmission. 4,543,786, Cl. 60-435.000.

Shwayder, Warren M. Helicopter landing skid shoe pad. 4,544,116, Cl. 244-108.000.

Sickler, Emory J., to Mi-Jack Products, Inc. Sway control arrangement for hoist systems. 4,544,070, Cl. 212-147.000.

Siden, Dennis C., to Raychem Corporation. Circuit change pin and circuit board assembly. 4,544,802, Cl. 174-68.500.

Siegel, Robert C., to University of California, The Regents of the. Synthesis of cross-links in the helical domain of collagen using pyridoxal 5-phosphate and copper or iron. 4,544,638, Cl. 435-273.000.

Siegell, Jeffrey H.; and Coulaloglou, Costas A., to Exxon Research and Engineering Co. Fluidity of a continuous transverse flow magnetically stabilized fluidized bed. 4,543,733, Cl. 34-1.000.

Siemens AG: *See*—
Lerch, Reinhard, 4,543,828, Cl. 73-626.000.
Lerch, Reinhard, 4,543,829, Cl. 73-626.000.

Siemens Aktiengesellschaft: *See*—
Haussman, Wolfgang, 4,544,947, Cl. 358-65.000.
Heinzl, Joachim, 4,544,933, Cl. 346-140.00R.
Rupp, Guenter, 4,544,482, Cl. 210-222.000.
Schaller, Werner, 4,544,221, Cl. 339-60.00M.
Wiedeburg, Klaus, 4,545,078, Cl. 455-600.000.

Siemer, Hans: *See*—
Figge, Dieter; Siemer, Hans; Artz, Gerd; and Philipp, Clemens, 4,544,018, Cl. 164-481.000.

Siepmann-Werke GmbH & Co. KG: *See*—
Friedewald, Gunter, 4,544,010, Cl. 152-231.000.

Sierakoski, J. Michael: *See*—
Kordosky, Gary A.; Sudderth, R. Brantley; Sierakoski, J. Michael; and MacKay, Kenneth D., 4,544,532, Cl. 423-24.000.

Sigel, Albert: *See*—
Maier, Peter; and Sigel, Albert, 4,543,866, Cl. 83-471.300.

Silberline Manufacturing Company, Inc.: *See*—
Kern, George M., 4,544,600, Cl. 428-323.000.

Silva, Raimund H.; and Smith, Roger A., to Du Pont de Nemours, E. I., and Company. Electrolytic cell with cation exchange membrane having high equivalent weight component. 4,544,471, Cl. 204-252.000.

Silvis, Salvatore J., to Colgate-Palmolive Company. Neutralization of organic sulfuric or sulfonic detergent acid to produce high solids concentration detergent salt. 4,544,493, Cl. 252-89.100.

Simashkevich, Richard M.; and Sharp, William J., to Nordson Corporation. Liquid spray gun having quick change pattern control. 4,544,100, Cl. 239-407.000.

Simmons, Catherine J.: *See*—
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,544,499, Cl. 252-629.000.

Simmons, Joseph H.: *See*—
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, 4,544,499, Cl. 252-629.000.

Simplimatic Engineering Co.: *See*—
Wiseman, John A., 4,543,767, Cl. 53-76.000.

Singh, Prithipal: *See*—
Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, 4,544,765, Cl. 560-29.000.

Sirota, Vladimir. Umbrella holder. 4,543,971, Cl. 135-16.000.

Skakoon, James G.; Johanson, Donald L.; and Bonthron, Raymond J., to C. R. Bard, Inc. Battery operated miniature syringe infusion pump. 4,544,369, Cl. 604-155.000.

SKF Industrial Trading Development Co. B.V.: *See*—
Cuijpers, Mathias J. M., 4,544,164, Cl. 277-25.000.

SKF Kugellagerfabriken GmbH: *See*—
Hans, Rudiger; and Friedrich, Wolfgang, 4,544,168, Cl. 277-84.000.

Skotheim, Terje A., to United States of America, Energy. Method of synthesizing polymers from a solid electrolyte. 4,544,456, Cl. 204-59.00R.

Skrypek, John P.; Williams, Robert; Dominico, James W.; and Rohr, Albin, to Sun Chemical Corporation. Apparatus for printing frustoconical articles. 4,543,883, Cl. 101-38.00A.

Skutta, Frank R.; and Klaus, Thomas R., to Motorola, Inc. Method and apparatus for eliminating interference due to spurious signals generated in synthesized receivers. 4,545,072, Cl. 455-183.000.

Sloan Valve Company: *See*—
Allen, Charles S.; Berg, Arthur A.; Schmitt, Eugene W.; Stoltenberg, Michael R.; and Lissau, Frederic, 4,544,132, Cl. 251-318.000.
Lissau, Frederic, 4,544,046, Cl. 188-79.50K.

Slocum, Chester D.; and Cutolo, Vincent T., to Cordis Corporation. Analog telemetry system for biomedical implant. 4,543,953, Cl. 128-419.0PT.

Slungaard, Knut, deceased: *See*—
Nilsson, Rolf; Bjornfoth, Hakan; and Slungaard, Knut, deceased, 4,543,808, Cl. 72-137.000.

Smith, Bernard: *See*—
Branovich, Louis E.; Smith, Bernard; and Freeman, Gerard L., 4,544,535, Cl. 423-290.000.

Smith, Douglas G.: *See*—
Al-Sheikh, Abdelraouf M.; Avci, Sakir T.; Kelso, Kenneth S.; Kwek, Seng H.; McBean, Lionel B.; Pugh, Stuart; and Smith, Douglas G., 4,544,178, Cl. 280-642.000.

Smith, Fritz A.; and Tabak, Samuel A., to Mobil Oil Corporation. Upgrading Fischer-Tropsch olefins. 4,544,792, Cl. 585-533.000.

Smith, James E.: *See*—
Warman, Thomas E.; Baker, Gordon P.; and Smith, James E., 4,544,090, Cl. 227-131.000.

Smith, Kenneth M. Martial arts weapon. 4,543,721, Cl. 30-287.000.

Smith, Richard D. Treatment of water damaged cellulosic materials. 4,543,734, Cl. 34-5.000.

Smith, Richard D., to Internationale Octrooi Maatschappij "Octropa" B.V. Hose end fitting. 4,544,187, Cl. 285-256.000.

Smith, Roger A.: *See*—
Silva, Raimund H.; and Smith, Roger A., 4,544,471, Cl. 204-252.000.

Smith, Stephen R.: *See*—
Lanham, William E.; and Smith, Stephen R., 4,544,352, Cl. 432-133.000.

Smolanoff, Joel R.; Fitzpatrick, J. Michael; and Ollinger, Janet, to Rohm and Haas Company. Pesticidal phosphoroamido (di) thioates. 4,544,553, Cl. 514-92.000.

SMS Schloemann-Siemag AG: *See*—
Stoy, Erich; and Rommen, Hans, 4,543,810, Cl. 72-245.000.

Snider, Glenn R.: *See*—
Spinks, R. Joe, Jr.; Snider, Glenn R.; and Deasy, Richard E., 4,545,059, Cl. 375-1.000.

Snyder, Dennis L.: *See*—
Graves, Daniel F.; and Snyder, Dennis L., 4,544,537, Cl. 423-300.000.

Snyder, Evan S.: *See*—
Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, 4,544,765, Cl. 560-29.000.

Societe Alasacienne de Construction de Materiel Textile: *See*—
Moessinger, Albert; Gosciniak, Guy; and Angebault, Joel, 4,544,001, Cl. 139-443.000.

S.A. Robinetterie, S.F.R.: *See*—
Huveteau, Jean L., 4,543,988, Cl. 137-542.000.

Societe Carbochimique: *See*—
Lambert, Pierre M.; and De Aguirre-Otegui, Ignacio, 4,544,743, Cl. 544-64.000.

Societe Delsey: *See*—
Seynhaeve, Andre G., 4,544,050, Cl. 190-115.000.

Societe des Electrodes et Refractaires Savoie (SERS): *See*—
Dumas, Daniel; du Mesnildot, Bruno; and Michel, Christian, 4,544,641, Cl. 501-87.000.

Societe Europeenne de Propulsion: *See*—
Buttazzoni, Bernard, 4,544,599, Cl. 428-262.000.

Societe Nationale Elf Aquitaine: *See*—
Dupin, Thierry; and Voirin, Robert, 4,544,534, Cl. 423-230.000.

SODECO - SAIA AG: *See*—
Portmann, Albert, 4,544,815, Cl. 200-50.00C.

Sofia, Santo J.: *See*—
Swank, Harry R.; Doggett, Fred F.; Huyler, Lee E.; and Sofia, Santo J., 4,544,955, Cl. 358-246.000.

Sofranko, John A.; and Jones, C. Andrew, to Atlantic Richfield Company. Methane conversion. 4,544,784, Cl. 585-500.000.

Sofranko, John A.: *See*—
Withers, Howard P.; and Sofranko, John A., 4,544,785, Cl. 585-500.000.

Sogah, Dotsevi Y.; and Webster, Owen W., to Du Pont de Nemours, E. I., and Company. Silylated vinyl alcohol polymers. 4,544,724, Cl. 526-279.000.

Soisson, Lawrence R.: *See*—
Moore, Paul E.; Strohl, Robert L.; and Soisson, Lawrence R., 4,544,139, Cl. 266-48.000.

Solavolt International: *See*—
Bailey, William L.; and Kaszeta, William J., 4,544,876, Cl. 323-282.000.

Solco Basel AG: *See*—
Fraefel, Wolfgang; and Tschannen, Roland, 4,544,552, Cl. 514-23.000.

Soled, Stuart L.; and Fiato, Rocco A., to Exxon Research and Engineering Co. Process for preparing high surface area iron/cobalt Fischer-Tropsch slurry catalysts. 4,544,671, Cl. 518-700.000.

Soled, Stuart L.: *See*—
Fiato, Rocco A.; and Soled, Stuart L., 4,544,672, Cl. 518-700.000.
Fiato, Rocco A.; Soled, Stuart L.; and Montagna, Angelo A., 4;544,674, Cl. 518-717.000.

Solomon, Joseph M.; and Varker, Kenneth J., to International Business Machines Corporation. System for repairing electrical short circuits between parallel printed circuits. 4,544,439, Cl. 156-626.000.

Solomon, Stephen R.: *See*—
Lake, Ralph J., Jr.; Steckowich, John, Jr.; and Solomon, Stephen R., 4,544,301, Cl. 403-300.000.

Solvay & Cie S.A.: *See*—
Dumoulin, Joseph; and De Berraly, Jean-Marie, 4,544,684, Cl. 523-136.000.

Soma, Kazunori; and Kasahara, Yasushi, to Fujizoki Pharmaceutical Co., Ltd. Anti immune complex antibody for determining SLE, rheumatoid arthritis or tetanus. 4,544,640, Cl. 436-506.000.

Sominin, Mikhail A.; Surikov, Valery N.; Belokopytov, Jury A.; and Fesenko, Evgeny P. Method and automatic control apparatus for controlling a technological process. 4,545,008, Cl. 364-148.000.

Sonneborn, Siegfried; Handel, Manfred; and Mack, Ernst, to Rasmussen Holding A/S. Flashing frame for the installation of adjacent roof windows. 4,543,753, Cl. 52-15.000.

Sony Corporation: *See*—
Ishikawa, Nobuyuki, 4,544,897, Cl. 331-116.00R.
Odaka, Kentaro, 4,544,958, Cl. 360-8.000.
Ozawa, Kazuo; and Sawa, Tetsuo, 4,544,977, Cl. 360-133.000.
Watanabe, Toshiaki; Uenishi, Toshifumi; Sahara, Hiroshi; and Yamaoka, Katsumi, 4,544,922, Cl. 340-728.000.

Sorrell, Furman Y.; Curtin, Thomas B.; and Feezor, Michael D., to Seametrics, Inc. Electromagnetic shearflowmeter for remote oceanic applications. 4,543,822, Cl. 73-170.00A.

Soth, Henry J.: *See*—
Porterfield, Richard; Soth, Henry J.; and Biesecker, Douglas A., 4,543,705, Cl. 29-566.300.

Souquet, Jacques: *See*—
Harui, Norio; and Souquet, Jacques, 4,543,960, Cl. 128-660.000.

Soussloff, Dimitri G., to Fenner America Inc. Method for anchoring a machine element coaxially on a rotary shaft. 4,543,704, Cl. 29-458.000.

Southwest Research Institute: *See*—
Baker, Quentin A., 4,543,930, Cl. 123-299.000.

Sovonics Solar Systems: *See*—
Cannella, Vincent D., 4,544,798, Cl. 136-251.000.

Spector, Donald. Aroma-generating capsule. 4,544,592, Cl. 428-68.000.

Spectra-Physics, Inc.: *See*—
Rando, Joseph F., 4,544,228, Cl. 350-6.400.

Spectronics, Inc.: *See*—
Biard, James R.; and Elmer, Ben R., 4,545,076, Cl. 455-612.000.

Sperry Corporation: *See*—
Chi, Chao S., 4,544,961, Cl. 360-40.000.
Jacoby, George V.; and Schwartz, Allan A., 4,544,963, Cl. 360-40.000.
Kroger, Harry, 4,544,937, Cl. 357-5.000.
Kurth, Richard R.; and Gabel, Robert A., 4,544,927, Cl. 343-373.000.

Spieldiener, Reinhold: *See*—
Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons, 4,543,886, Cl. 104-53.000.

Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons, to Intamin Inc. Amusement ride including a rotating loading terminal. 4,543,886, Cl. 104-53.000.

Spinks, R. Joe, Jr.; Snider, Glenn R.; and Deasy, Richard E., to Rockwell International Corporation. Antenna coupler system. 4,545,059, Cl. 375-1.000.

Spiro, Vladimir: *See*—
Kammerer, Walter; and Spiro, Vladimir, 4,545,049, Cl. 370-16.000.

Spring, Robert P. Reversible numeric color-coded labels. 4,544,182, Cl. 283-81.000.

Springer, Gilbert D., to Ferix Corporation. Multi-directional field annealing of a thin-film electromagnetic read/write head. 4,544,421, Cl. 148-103.000.

SRI International: *See*—
Crane, Hewitt D.; and Kelly, Donald H., 4,544,246, Cl. 351-211.000.

Stackpole Limited: *See*—
King, George W., 4,544,431, Cl. 156-256.000.

Stahlecker, Otto: *See*—
Franz, Klaus-Dieter; Kieser, Manfred; and Stahlecker, Otto, 4,544,415, Cl. 106-288.00R.

Standard Oil Company: *See*—
Lemanski, Michael F.; and Kliewer, Wayne R., 4,544,673, Cl. 518-713.000.
Taylor, James L., 4,544,477, Cl. 208-11.00R.

Stanley, Keith D.: *See*—
White, Kenneth B.; Richmond, James M.; and Stanley, Keith D., 4,544,506, Cl. 260-462.00R.

Stansbury, Benjamin H., Jr., to McKesson Corporation. Adjustable safety spectacle. 4,544,245, Cl. 351-120.000.

Stant Inc.: *See*—
Szlaga, Emil, 4,543,938, Cl. 123-514.000.

Stark, Sven O. S.; and Andersson, Lars-Olof, to Tetra Pak International AB. Edge-bonding of sheet material. 4,544,093, Cl. 229-43.000.

Statomat-Globe Maschinenfabrik GmbH: *See*—
Muskulus, Willi, 4,544,315, Cl. 414-115.000.

Stauffer Chemical Company: *See*—
Chavdarian, Charles G.; and Haag, William G., 4,544,651, Cl. 514-120.000.
Fesman, Gerald, 4,544,678, Cl. 521-107.000.
Jacobs, Barry A., 4,544,680, Cl. 521-128.000.
Lee, David L., 4,544,399, Cl. 71-88.000.
Tam, Teresa M.; and Baker, Don R., 4,544,398, Cl. 71-88.000.

Stauffer, Norman L. Fishing reel with antireverse and direct drive features. 4,544,114, Cl. 242-213.000.

Steckowich, John, Jr.: *See*—
Lake, Ralph J., Jr.; Steckowich, John, Jr.; and Solomon, Stephen R., 4,544,301, Cl. 403-300.000.

Steeves, John K., Jr., to Tele-Lite, Inc. Knuckled lamp head bracket mount for generator. 4,544,994, Cl. 362-192.000.

Steffes, Helmut: *See*—
Burgdorf, Jochen; and Steffes, Helmut, 4,543,791, Cl. 6-550.000.

Steierman, Herbert L., to Northern Telecom Limited. Data format converter. 4,545,052, Cl. 370-68.000.

Steinberger, Wolfgang: *See*—
Parzefall, Walter; Pflugner, Wolfgang; and Steinberger, Wolfgang, 4,544,212, Cl. 308-6.00R.

Steklenski, David J.: *See*—
Upson, Donald A.; and Steklenski, David J., 4,544,723, Cl. 524-347.000.

Stencel, Edgar L., to VSI Corporation. Pin and process for its manufacture. 4,544,312, Cl. 411-3.000.

Stendal, Wilhelm: *See*—
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.

Stephens, James O. Gas turbine rub detector. 4,543,830, Cl. 73-660.000.

Stern, Mark; Airesman, Charles; and Pandit, Vijay, to Allegany Technology, Inc. Load cell temperature compensation system. 4,543,837, Cl. 73-862.630.

Steudler, Frederick W., Jr., to Val Products, Inc. Watering system for fowl. 4,543,912, Cl. 119-18.000.

Stevens, Theodore E.: *See*—
Ross, Gilbert B.; and Stevens, Theodore E., 4,544,584, Cl. 428-15.000.

Stewart, Sam E.: *See*—
Raus, Robert W.; and Stewart, Sam E., 4,544,225, Cl. 339-91.00R.

Stewart-Warner Corporation: *See*—
Provolo, Daniel J., 4,544,425, Cl. 156-73.100.

Stiller, Thomas M.: *See*—
Lewis, Henry G., Jr.; and Stiller, Thomas M., 4,544,945, Cl. 358-30.000.

Stock, William H., to Rockwell International Corporation. Method and system for store rack carriage. 4,543,873, Cl. 89-1.590.

Stockman, James J., to Shaw Industries Ltd. Method and apparatus for applying a coating material to a pipe. 4,544,426, Cl. 156-73.600.

Stohr, Frank-Michael; and Nickel, Horst, to Bayer Aktiengesellschaft. Piperazinyl-triazinylnaphtholsulphonic acid azo dyes. 4,544,737, Cl. 534-605.000.

Stoker, Albert, to U.S. Philips Corporation. Audio-amplifier arrangement. 4,544,895, Cl. 330-273.000.

Stoll, Kurt; and Glattli, Hans-Heinrich. Choke unit. 4,544,130, Cl. 251-208.000.

Stoltenberg, Michael R.: *See*—
Allen, Charles S.; Berg, Arthur A.; Schmitt, Eugene W.; Stoltenberg, Michael R.; and Lissau, Frederic, 4,544,132, Cl. 251-318.000.

Stone & Webster Engineering Corporation: *See*—
Gartside, Robert J.; and Woebcke, Herman N., 4,544,480, Cl. 208-127.000.

Storage Technology Partners II: *See*—
Baer, James R.; Manes, Kenneth; and Lunka, Harold, 4,545,045, Cl. 369-77.200.
Rickert, David W., 4,545,047, Cl. 369-290.000.

Storch, Helmut: *See*—
Meiller, Hermann; and Storch, Helmut, 4,544,598, Cl. 428-246.000.

Stormont, Richard W.; and Eriss, Lawrence, to Mobil Solar Energy Corporation. Apparatus for growing tubular crystalline bodies. 4,544,528, Cl. 422-246.000.

Stout, Gregg W.; and Nelson, John A., to Baker Oil Tools, Inc. Method of detachably securing an explosive charge container in a hollow carrier for a perforating device. 4,543,700, Cl. 29-426.400.

Stout, Gregg W.: *See*—
Wetzel, Rodney J.; and Stout, Gregg W., 4,543,703, Cl. 29-455.00R.

Stoy, Erich; and Rommen, Hans, to SMS Schloemann-Siemag AG. Six-high rolling stand. 4,543,810, Cl. 72-245.000.

Strassle, Warren F.: *See*—
Iadarola, Ralph E.; Strassle, Warren F.; and Russo, Gene W., 4,543,715, Cl. 29-852.000.

Strassler, Sigfrid: *See—*
Troup, Alan; Strassler, Sigfrid; Guttinger, Hannes; and Pfister, Gustav, 4,543,815, Cl. 73-28.000.
Streusand, Marie J.; Getson, John C.; and McAfee, Richard C., to SWS Silicones Corporation. Silicone elastomers having thermally conductive properties. 4,544,696, Cl. 524-428.000.
Stringer, Robert A., to Textron, Inc. Surface effect ship air cushion seal system. 4,543,901, Cl. 114-67.00A.
Strobel, Klaus: *See—*
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,544,345, Cl. 425-405.00R.
Strohl, Robert L.: *See—*
Moore, Paul E.; Strohl, Robert L.; and Soisson, Lawrence R., 4,544,139, Cl. 266-48.000.
Strohmaier, Ernst: *See—*
Eibofner, Eugen; and Strohmaier, Ernst, 4,544,355, Cl 433-104.000.
Struck, Bernd-Dieter; Biallas, Bernd; and Schulten, Rudolf, to Kernforschungsanlage Julich, Gesellschaft mit Beschrankter Haftung. Process for obtaining hydrogen and oxygen from water. 4,544,459, Cl. 204-103.000.
Stuart, Frank A.: *See—*
Tyson, William H.; and Stuart, Frank A., 4,544,491, Cl. 210-772.000.
Stuart, James M., to Malvern Scale Company. Electronic scale with counterbalance. 4,544,043, Cl. 177-194.000.
Studt, William L.; Dodson, Stuart A.; Zimmerman, Harry K.; and Barnes, James L., to William H. Rorer, Inc. Method of treating coccidiosis with acyl guanidines. 4,544,670, Cl. 514-617.000.
Stuparits, Jeffrey J.; and Cramer, Russell L., to General Telephone of Michigan. Arrangement for subscriber line ring testing. 4,544,809, Cl. 179-175.20R.
Sturans, Maris A.: *See—*
Langner, Gunther O.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,544,846, Cl. 250-396.0ML.
Sturdy, Harry D., to Sturdy Truck Equipment, Inc. Cable transfer device with lost motion coupling for governors. 4,543,932, Cl. 123-342.000.
Sturdy Truck Equipment, Inc.: *See—*
Sturdy, Harry D., 4,543,932, Cl. 123-342.000.
Sudderth, R. Brantley: *See—*
Kordosky, Gary A.; Sudderth, R. Brantley; Sierakoski, J. Michael; and MacKay, Kenneth D., 4,544,532, Cl. 423-24.000.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Ingelmann, Hans-Joachim; and Kampf, Hans, 4,543,802, Cl. 62-525.000.
Suga, Shigeru. Apparatus for testing light fastness of a material. 4,544,995, Cl. 362-225.000.
Sugiyama, Masahiko: *See—*
Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, 4,544,338, Cl. 418-63.000.
Sugiyama, Sakae, to Hitachi, Ltd. Method of detecting a leakage of fluid. 4,543,817, Cl. 73-40.50A.
Suk, Laddie E.: *See—*
Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., 4,544,804, Cl. 179-18.0BC.
Sullivan, Donald F. Photoprinting process and apparatus for exposing photopolymers. 4,544,626, Cl. 430-311.000.
Sumita, Osao: *See—*
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Shoji, Saburo; and Sumita, Osao, 4,544,462, Cl. 204-129.000.
Sumitomo Chemical Co., Ltd.: *See—*
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,544,635, Cl. 435-121.000.
Okamoto, Hideho; and Nishio, Ken-ichi, 4,544,610, Cl. 428-611.000.
Sagou, Masakazu, 4,544,773, Cl. 568-487.000.
Sasaki, Mitsuru; and Ishiguri, Yukio, 4,544,652, Cl. 514-127.000.
Sumitomo Electric Industries, Ltd.: *See—*
Tsuji, Kazuo, 4,544,540, Cl. 423-446.000.
Sumitomo Rubber Industries: *See—*
Tominaga, Ichiro; and Sasaki, Teruo, 4,543,827, Cl. 73-602.000.
Sun Chemical Corporation: *See—*
Hui, Sai H., 4,544,609, Cl. 428-507.000.
Skrypek, John P.; Williams, Robert; Dominico, James W.; and Rohr, Albin, 4,543,883, Cl. 101-38.00A.
Wieme, Samuel P.; and Williams, Robert, 4,544,915, Cl. 340-347.00P.
Sundet, Sherman A., to Du Pont de Nemours, E. I., and Company. Reverse osmosis membrane quenching. 4,544,484, Cl. 210-500.200.
Sundstrand Corporation: *See—*
Glover, John H., 4,545,019, Cl. 364-463.000.
Surgant, John M., to Monsanto Company. Water-soluble film. 4,544,693, Cl. 524-375.000.
Surgidev Corporation: *See—*
Drake, Anthony F.; Masse, Fernard J.; and Grendahl, Dennis T., 4,543,673, Cl. 623-6.000.
Surikov, Valery N.: *See—*
Sominin, Mikhail A.; Surikov, Valery N.; Belokopytov, Jury A.; and Fesenko, Evgeny P., 4,545,008, Cl. 364-148.000.
Susa, Ermanno: *See—*
Mayr, Adolfe; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettoro, 4,544,717, Cl. 526-125.000.
Suyama, Takahiro: *See—*
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Suyama, Takahiro; and Yano, Seiki, 4,545,057, Cl. 372-45.000.
Suzuki, Hirofumi; Waki, Masahiko; and Harada, Kunimitsu, to Citizen Watch Co., Ltd. Impact dot printing head. 4,544,288, Cl. 400-121.000.
Suzuki, Jun: *See—*
Nagatomo, Hiroto; Maejima, Hisashi; Suzuki, Jun; and Fujikawa, Keishin, 4,544,318, Cl. 414-222.000.
Suzuki, Kiyoshi: *See—*
Kawanami, Hisashi; Suzuki, Kiyoshi; and Kawauchi, Akihiro, 4,544,999, Cl. 362-298.000.
Suzuki, Koji: *See—*
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, 4,544,848, Cl. 250-578.000.
Suzuki, Masaki; and Hasegawa, Mikio, to Matsushita Electric Industrial Company, Ltd. Method of correcting unbalance of a rotating body. 4,545,021, Cl. 364-571.000.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Memory reset arrangement for mirror. 4,544,871, Cl. 318-568.000.
Suzuki, Osamu: *See—*
Oishi, Kengo; Komiyama, Choji; and Suzuki, Osamu, 4,544,976, Cl. 360-132.000.
Suzuki, Shigeo: *See—*
Kataoka, Masao; Oshima, Yujiro; Noda, Takashi; and Suzuki, Shigeo, 4,543,929, Cl. 123-263.000.
Suzuki, Toshio, to Kao Corporation. Pearlescent liquid suspension. 4,544,498, Cl. 252-547.000.
Suzuki, Yoshihisa: *See—*
Seiki, Kazuo; Suzuki, Yoshihisa; and Yasui, Yoshiharu, 4,543,776, Cl. 57-261.000.
Suzuki, Yoshitaka: *See—*
Ochiai, Akira; and Suzuki, Yoshitaka, 4,544,198, Cl. 296-155.000.
Svab, Eugen; van Deursen, Petrus H.; and Cadee, Theodorus P. M., to Ford-Werke Aktiengesellschaft; and Van Doorne's Transmissie B.V. Clutch assembly for a planetary forward reverse gear set. 4,543,852, Cl. 74-695.000.
Svensson, Rolf. Method and a device for expelling liquid by squeezing of masses having great liquid content. 4,543,880, Cl. 100-37.000.
Svoboda, Josef, to TMC Corporation. Ski brake. 4,544,177, Cl. 280-605.000.
Swan, Henry B.: *See—*
Bauer, Gerald; and Swan, Henry B., 4,543,942, Cl. 126-314.000.
Swank, Harry R.; Doggett, Fred F.; Huyler, Lee E.; and Sofia, Santo J., to General Electric Company. Implosion resistant cathode ray tubes. 4,544,955, Cl. 358-246.000.
Sweeney, Gerald T., to Tigre Tierra, Inc. Apparatus for driving an elongated piece into and/or out of the ground. 4,544,040, Cl. 173-91.000.
Swift, Allan W.; and Rivara, Sarah B. S., to E. J. Brooks Company. Connection nut seal. 4,544,190, Cl. 292-307.00B.
Swisher, James A. Plunger operated lock. 4,543,807, Cl. 70-34.000.
Swiss Aluminium Ltd.: *See—*
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, 4,544,524, Cl. 419-9.000.
SWS Silicones Corporation: *See—*
Streusand, Marie J.; Getson, John C.; and McAfee, Richard C., 4,544,696, Cl. 524-428.000.
Sybert, Edward M.: *See—*
Keggins, Kathleen M.; Davis, Ann C.; Sybert, Edward M.; Mays, Thomas D.; and Milch, Robert A., 4,544,637, Cl. 435-253.000.
Sylvania Electric Products Inc.: *See—*
Hileman, Ronald E., 4,545,061, Cl. 375-119.000.
Syra Company: *See—*
Khanna, Pyare; Snyder, Evan S.; and Singh, Prithipal, 4,544,765, Cl. 560-29.000.
Syrinek, Allen R.: *See—*
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,544,719, Cl. 526-240.000.
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,544,722, Cl. 526-264.000.
Syscon Corporation: *See—*
deButts, Harry A., II, 4,544,124, Cl. 248-552.000.
Szabo, Zsolt, to Labor Muszeripari Muvek. Bistable valve. 4,544,127, Cl. 251-9.000.
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, to Egyt Gyogyszervegyeszeti Gyar. Process for the preparation of 5-(2-bromovinyl)-uridine. 4,544,740, Cl. 536-23.000.
Szemzo, Attila: *See—*
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Szemzo, Attila; Peredy nee Kajtar, Maria; Horvath, Istvan; Koczka, Istvan; Rethati, Csilla; Ivan, Pal; Fritzsche nee Lukacs, Ildiko ; and Nagy, Janos, 4,544,740, Cl. 536-23.000.
Szlaga, Emil, to Stant Inc. In-line fuel reservoir. 4,543,938, Cl. 123-514.000.
Tabak, Samuel A.: *See—*
Smith, Fritz A.; and Tabak, Samuel A., 4,544,792, Cl. 585-533.000.
Tabasa, Fujio: *See—*
Ishikawa, Hiroshi; Tabasa, Fujio; and Nakagawa, Kazuyuki, 4,544,747, Cl. 546-156.000.
Tabata, Mitsuo; Kidode, Masatsugu; and Yamaguchi, Noboru, to Tokyo Shibaura Denki Kabushiki Kaisha. Image processing system. 4,545,068, Cl. 382-41.000.
Tabler, William R. Adjustable holster. 4,544,089, Cl. 224-192.000.
Tachikawa, Hiromichi: *See—*
Takahashi, Yonosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,544,627, Cl. 430-325.000.

Tadokoro, Eiichi: *See*—
Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,544,601, Cl. 428-330.000.

Tagawa, Shigetaro: *See*—
Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, 4,544,338, Cl. 418-63.000.

Taillet, Joseph; and Larigaldie, Serge, to Office National d'Etudes et de Recherche Aerospatiales (ONERA). Apparatus for separating particles in suspension in a gas. 4,544,382, Cl. 55-107.000.

Taitel, Charles M. Passive-type treadmill. 4,544,152, Cl. 272-69.000.

Taka, Hideo; and Andresen, Bernhard H., to Texas Instruments Incorporated. Automatic exposure control for a camera shutter. 4,544,257, Cl. 354-460.000.

Takahashi, Akira: *See*—
Ohta, Kenji; Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,544,443, Cl. 156-643.000.

Takahashi, Hiroshi, to Canon Kabushiki Kaisha. Battery voltage detector. 4,544,893, Cl. 324-433.000.

Takahashi, Izumi: *See*—
Moriki, Yasumitsu; Sato, Tadashi; Yamamoto, Kazuyoshi; and Takahashi, Izumi, 4,543,818, Cl. 73-49.800.

Takahashi, Seikichi: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.

Takahashi, Takashi: *See*—
Yamashita, Youhachi; Takahashi, Takashi; and Harata, Mituo, 4,544,644, Cl. 501-134.000.

Takahashi, Toru, to Iwatsu Electric Co., Ltd. Cathode ray oscilloscope with a dual control knob assembly for easy zero level adjustment. 4,544,885, Cl. 324-121.00R.

Takahashi, Yonosuke; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Negative image forming process in o-quinone diazide layer utilizing laser beam. 4,544,627, Cl. 430-325.000.

Takamatsu, Hidetoshi: *See*—
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.

Takano, Shouji, to Tokyo Shibaura Denki Kabushiki Kaisha. Image density detecting unit for image formation apparatus. 4,544,258, Cl. 355-1.000.

Takano, Tsunesuke, to Kabushiki Kaisha T AN T. Compact fuse block assembly. 4,544,907, Cl. 337-262.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,544,653, Cl. 514-202.000.
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,544,751, Cl. 548-127.000.

Takatori Machinery Works Ltd.: *See*—
Nishikawa, Masao; and Ashida, Takahiro, 4,543,768, Cl. 53-117.000.

Takaya, Haruo: *See*—
Okado, Hideo; Hashimoto, Kazuo; Kawamura, Kichinari; Yamazaki, Yasuyoshi; and Takaya, Haruo, 4,544,793, Cl. 585-640.000.

Takaya, Matsuhiko: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,545,070, Cl. 382-48.000.

Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, to Fujisawa Pharmaceutical Co., Ltd. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds and processes for the preparation thereof. 4,544,653, Cl. 514-202.000.

Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, to Fujisawa Pharmaceutical Co., Ltd. Thiadiazole derivatives. 4,544,751, Cl. 548-127.000.

Takayama, Makoto: *See*—
Kozuki, Susumu; and Takayama, Makoto, 4,544,959, Cl. 360-33.100.

Take, Takao; Kaneko, Katuaki; and Otozaki, Sigeo, to Onoda Cement Co., Ltd. Gypsum board manufacturing method. 4,544,424, Cl. 156-39.000.

Takebayashi, Masahiro; Sakazume, Akio; Iwata, Hiroshi; Sugiyama, Masahiko; Murata, Mitsuru; and Tagawa, Shigetaro, to Hitachi, Ltd. Oil feeder means for use in a horizontal type rotary compressor. 4,544,338, Cl. 418-63.000.

Takeda Chemical Industries, Ltd.: *See*—
Hozumi, Motoo; Tsushima, Susumu; and Yoshioka, Yoshio, 4,544,512, Cl. 260-925.000.

Takeda Riken Co., Ltd.: *See*—
Hayashi, Mishio, 4,544,884, Cl. 324-78.00R.

Takeuchi, Koji: *See*—
Hirai, Kiyomiki; Takeuchi, Koji; Abe, Masahiro; and Ito, Nobuo, 4,544,733, Cl. 528-123.000.

Takubo, Hiroichi; and Sasaki, Hiroshi, to Mazda Motor Corporation. Exhaust port structure for rotary piston engines. 4,543,926, Cl. 123-242.000.

Talley, Robert L.: *See*—
Hahn, William F.; McAdams, Hiramie T.; and Talley, Robert L., 4,544,101, Cl. 241-24.000.

Tam, Teresa M.; and Baker, Don R., to Stauffer Chemical Company. N-Carbonyl-N-(5,6-dihydro-2H-3-pyranylmethyl)-4-haloanilines as herbicides. 4,544,398, Cl. 71-88.000.

Tamada, Haruo: *See*—
Iwamoto, Hiromu; and Tamada, Haruo, 4,544,912, Cl. 340-347.0AD.

Tanabe, Hideo: *See*—
Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, 4,544,591, Cl. 428-65.000.

Tanaka, Hitoshi: *See*—
Miyazaki, Tomohiro; Tanaka, Hitoshi; Matsumoto, Goro; Matsuhisa, Noboru; and Omatoi, Susumu, 4,544,605, Cl. 428-404.000.

Tanaka, Ichiro: *See*—
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,543,970, Cl. 134-62.000.

Tanaka, Kazuo; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Optical system for camera with a viewfinder. 4,544,250, Cl. 354-199.000.

Tanaka, Masakatsu, to Nippon Air Brake Co., Ltd. Air dryer device for compressed air system of vehicle. 4,544,385, Cl. 55-208.000.

Tanaka, Masanori: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,544,604, Cl. 428-402.000.

Tanaka, Megumi; and Naito, Ryuichi, to Pioneer Electronic Corporation. Focus servo control device for an optical system having an initial focus locking operation. 4,544,837, Cl. 250-201.000.

Tanaka, Motoharu: *See*—
Kobayashi, Hiroshi; Machida, Hazime; and Tanaka, Motoharu, 4,544,602, Cl. 428-336.000.

Tanaka, Toshinori: *See*—
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, 4,543,923, Cl. 123-179.00F.

Tandy Corporation: *See*—
Berger, Michael F., 4,545,016, Cl. 364-200.000.

Taniguchi, Hiroshi; Ohtsu, Masamitsu; and Kubo, Kanji, to Matsushita Electric Industrial Co., Ltd. Tracking control system using intermittently recorded pilot signals. 4,544,966, Cl. 360-75.000.

Taomo, Toshio: *See*—
Nagashima, Akira; and Taomo, Toshio, 4,543,915, Cl. 123-41.650.

Taprogge Gesellschaft mbH: *See*—
Goldberg, Gerhard; and Lange, Alois, 4,544,027, Cl. 165-95.000.

Tarachand, Kishore. Composite magnet and magnetic circuit. 4,544,904, Cl. 335-302.000.

Tarleton, George K., to GTE Automatic Electric Incorporated. Race condition mediator circuit. 4,544,850, Cl. 307-269.000.

Tasaka, Yoshihiro: *See*—
Sawai, Mithio; Tasaka, Yoshihiro; Kawai, Toshikazu; and Katsuhara, Yutaka, 4,544,772, Cl. 568-411.000.

Tataria, Harshad: *See*—
Arenas, Alvaro; Box, John W.; Davis, Joseph H.; and Tataria, Harshad, 4,544,078, Cl. 220-256.000.

Tateishi, Mitsuru: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.

Taura, Mitsuharu: *See*—
Amano, Hidetoshi; Abe, Shinichi; Taura, Mitsuharu; and Mizuno, Toshiaki, 4,543,937, Cl. 123-491.000.

Tawada, Yoshihisa: *See*—
Tsuge, Kazunori; Tawada, Yoshihisa; and Hamakawa, Yoshihiro, 4,544,423, Cl. 148-174.000.

Taylor Freezer Company: *See*—
Frazer, John M., 4,544,085, Cl. 222-146.400.

Taylor, James L., to Standard Oil Company; and Gulf Oil Corporation. Polar solvent extraction and dedusting process. 4,544,477, Cl. 208-11.00R.

Taylor, Norman J., to Varian Associates, Inc. Multi-gap magnetic imaging lens for charged particle beams. 4,544,847, Cl. 250-396.0ML.

Taylor, Reginald M.; and Brock, Alan J. Pharmaceutical compound zinc glycerolate complex prepared by reacting zinc oxide and glycerol. 4,544,761, Cl. 556-130.000.

Taylor, Russell H.: *See*—
Hendriks, Ferdinand; and Taylor, Russell H., 4,544,889, Cl. 324-158.00P.

TDK Corporation: *See*—
Adachi, Shichiro; and Kotani, Sho, 4,544,829, Cl. 219-237.000.

Tegeler, John J.; and Diamond, Craig J., to Hoechst-Roussel Pharmaceuticals Incorporated. Isoxazole intermediates. 4,544,753, Cl. 548-245.000.

Teitel Sidney: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel Sidney; and O'Brien, Jay P., 4,544,657, Cl. 514-253.000.

Tektronix, Inc.: *See*—
Harris, David L., 4,544,902, Cl. 333-250.000.
Luka, Robert E., 4,543,717, Cl. 30-90.600.

Tele-Lite, Inc.: *See*—
Steeves, John K., Jr., 4,544,994, Cl. 362-192.000.

Teledyne Industries, Inc.: *See*—
Haglund, Richard A.; and Tupack, Robert E., 4,543,677, Cl. 14-71.500.
Rogo, Casimir; and Lenz, Herman N., 4,544,325, Cl. 415-150.000.

Tenberg, Werner; and Kolb, Gustav, to Mannesmann AG; and Kolb, Gustav. Device for measuring the level of the interface between a slag layer and a bath of molten metal in a metallurgical vessel. 4,544,140, Cl. 266-99.000.

Tennant Radiant Heat Limited: *See*—
Herbert, Eric D., 4,544,347, Cl. 431-125.000.
Teraoka, Kazuharu, to Teraoka Seikosho Co., Ltd. Printing control apparatus for a label printer, method of using the apparatus, and a label used in conjunction with the apparatus. 4,544,287, Cl. 400-120.000.
Teraoka Seikosho Co., Ltd.: *See*—
Teraoka, Kazuharu, 4,544,287, Cl. 400-120.000.
Terrana, Donald B.: *See*—
Folling, Norman D.; and Terrana, Donald B., 4,544,319, Cl. 414-505.000.
Terry, Ruel C., to In Situ Technology, Inc. Initiating production of methane from wet coal beds. 4,544,037, Cl. 166-369.000.
Tetra Pak International AB: *See*—
Stark, Sven O. S.; and Andersson, Lars-Olof, 4,544,093, Cl. 229-43.000.
Teubel, Johannes: *See*—
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,544,650, Cl. 502-424.000.
Texaco Inc.: *See*—
Davis, Lorne A., Jr., 4,543,821, Cl. 73-153.000.
Texas Instruments Incorporated: *See*—
Bellay, Jeffrey D.; and Thaden, Robert C., 4,545,038, Cl. 365-230.000.
Chatterjee, Pallab; Shichijo, Hisashi; and Leiss, John E., 4,545,034, Cl. 365-182.000.
Conrad, Marvin; Guttag, Karl M.; Schabowski, John V.; Roskell, Derek; Carey, Jim A.; and Shore, Brian, 4,544,851, Cl. 307-480.000.
Meador, Charles G.; and Breashears, Eddie H., 4,544,416, Cl. 148-1.500.
Taka, Hideo; and Andresen, Bernhard H., 4,544,257, Cl. 354-460.000.
Texas Turbine, Inc.: *See*—
Giroux, Claude, 4,544,167, Cl. 277-82.000.
Textron, Inc.: *See*—
Stringer, Robert A., 4,543,901, Cl. 114-67.00A.
Thaden, Robert C.: *See*—
Bellay, Jeffrey D.; and Thaden, Robert C., 4,545,038, Cl. 365-230.000.
Theobald, Donald L., to Harris-Thomas Drop Forge Company, The. Forging apparatus. 4,543,812, Cl. 72-354.000.
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Thirumalachar, Mandayam J. K., to Phyton/AG, Inc. Chemotherapeutic agents for the control of plant diseases. 4,544,666, Cl. 514-460.000.
Thirumalachar, Mandayam J. K.: *See*—
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Thirumalachar, Mandayam J. K., 4,544,666, Cl. 514-460.000.
Thomerson, Clarence, to Regal International, Inc. Protector clamp for well control lines. 4,543,998, Cl. 138-110.000.
Thomson-CSF: *See*—
Drabowitch, Serge; and Leterrier, Guy, 4,544,925, Cl. 343-18.00E.
Pham van Cang, Luc, 4,544,952, Cl. 358-210.000.
Thrall Car Manufacturing Company: *See*—
Baker, William R., 4,543,887, Cl. 105-355.000.
Thyes, Marco: *See*—
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Gries, Josef; Lehmann, Hans D.; and Lenke, Dieter, 4,544,562, Cl. 514-247.000.
Tideswell, Richard B.; Nodelman, Neil H.; and Phillips, Barry A., to Mobay Chemical Corporation. Polyol blend and polyisocyanurate foam produced therefrom. 4,544,679, Cl. 521-116.000.
Tigre Tierra, Inc.: *See*—
Sweeney, Gerald T., 4,544,040, Cl. 173-91.000.
Tihanyi, George, to Northern Telecom Limited. Arc percussion welding a plated pin to a thin tab of dissimilar metal. 4,544,823, Cl. 219-121.0PK.
Times Fiber Communications, Inc.: *See*—
Miller, Gary E.; Mesiya, Mohammed F.; and Deichmiller, Arthur C., 4,545,075, Cl. 155-612.000.
Tims, Allan C.; and Henriquez, Theodore A., to United States of America, Navy. Shock-hardened hydrophone. 4,545,041, Cl. 367-157.000.
Tivoli Industries, Inc.: *See*—
George, Benjamin B., 4,544,996, Cl. 362-238.000.
TMC Corporation: *See*—
Svoboda, Josef, 4,544,177, Cl. 280-605.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,544,648, Cl. 502-119.000.
Tocchio, Louis A., to Reece Corporation, The. Machine for making a fly structure. 4,543,895, Cl. 112-104.000.
Toda, Toshiharu: *See*—
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,544,984, Cl. 361-119.000.
Toganoh, Shigeo: *See*—
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, 4,544,580, Cl. 427-261.000.
Tohyama, Yoshikuni: *See*—
Kanemitsu, Shinji; and Tohyama, Yoshikuni, 4,544,262, Cl. 355-3.0TR.
Tokico Kabushiki Kaisha: *See*—
Ishida, Kunio; and Kaneko, Shinji, 4,544,144, Cl. 267-64.150.
Tokuda, Ryuji: *See*—
Egawa, Akira; and Tokuda, Ryuji, 4,544,254, Cl. 354-403.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Komura, Seiichi, 4,544,121, Cl. 248-331.000.
Nunokawa, Kazuo, 4,544,248, Cl. 354-62.000.
Tokyo Shibaura Denki Kabushiki: *See*—
Shimizu, Makoto, 4,544,956, Cl. 358-296.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ariizumi, Shoji; and Segawa, Makoto, 4,544,941, Cl. 357-71.000.
Kamimaru, Nobuyuki, 4,545,063, Cl. 377-52.000.
Kurihara, Tetsuro, 4,544,949, Cl. 358-111.000.
Noh, Akihiko; Saijo, Yoshiaki; Sato, Shinichi; and Tanaka, Ichiro, 4,543,970, Cl. 134-62.000.
Ohno, Yoshio; Koyama, Katsuhiko; and Nishio, Kohsaku, 4,544,247, Cl. 352-62.000.
Okazaki, Kiyoshi, 4,544,948, Cl. 358-111.000.
Owada, Fumio; and Yamaguchi, Yoshiko, 4,544,934, Cl. 346-154.000.
Tabata, Mitsuo; Kidode, Masatsugu; and Yamaguchi, Noboru, 4,545,068, Cl. 382-41.000.
Takano, Shouji, 4,544,258, Cl. 355-1.000.
Yamashita, Youhachi; Takahashi, Takashi; and Harata, Mituo, 4,544,644, Cl. 501-134.000.
Tomac, Zeljko. Device for the thermal treatment of products, especially food and beverages. 4,544,022, Cl. 165-47.000.
Tomason, Garry. Prefabricated panel for roof or siding construction. 4,544,595, Cl. 428-116.000.
Tomihashi, Nobuyuki: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Shimizu, Yoshiki, 4,544,720, Cl. 526-247.000.
Tominaga, Ichiro; and Sasaki, Teruo, to Sumitomo Rubber Industries. Method for measuring physical properties of material. 4,543,827, Cl. 73-602.000.
Tomita, Akira: *See*—
Nanpei, Masaru; Tomita, Akira; Fujimura, Toshiaki; and Etoh, Kuniomi, 4,544,624, Cl. 430-281.000.
Tomlinson, Ronald S.; and Trent, Bryan O., to Heil-Quaker Corporation. Condensate handling means for condensing furnace. 4,543,892, Cl. 110-203.000.
Top-Scor Products, Inc.: *See*—
Forsythe, Curtis J., 4,544,569, Cl. 426-653.000.
Toray Industries, Inc.: *See*—
Yoshinaga, Minoru; and Matsubara, Nobuyuki, 4,544,113, Cl. 242-178.000.
Torigai, Katsumi; and Oka, Akio, to Sanshin Kogyo Kabushiki Kaisha. Mixture-warming device for a two-stroke internal combustion engine using a lower quality fuel. 4,543,921, Cl. 123-73.00A.
Toshiba Electric Equipment Corporation: *See*—
Kawanami, Hisashi; Suzuki, Kiyoshi; and Kawauchi, Akihiro, 4,544,999, Cl. 362-298.000.
Townsend, Douglas W.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,544,469, Cl. 204-243.00R.
Townsend, Lionel B. K.; and Townsend, Mary D., to Brydor Limited. Controlled power line filters for suppressing interference. 4,544,899, Cl. 333-17.00R.
Townsend, Mary D.: *See*—
Townsend, Lionel B. K.; and Townsend, Mary D., 4,544,899, Cl. 333-17.00R.
Toyne, Kenneth J.: *See*—
Abdullah, Hilal M.; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Toyne, Kenneth J., 4,544,497, Cl. 252-299.500.
Toyo Boseki Kabnushiki Kaisha: *See*—
Nanpei, Masaru; Tomita, Akira; Fujimura, Toshiaki; and Etoh, Kuniomi, 4,544,624, Cl. 430-281.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Narui, Mamoru; Nakagawa, Tatsushi; and Sakanaka, Yasuhiro, 4,544,709, Cl. 525-344.000.
Toyoda Gosei Co., Ltd.: *See*—
Itoh, Masaru, 4,544,339, Cl. 425-174.80R.
Toyota Jidosha Kabushiki Kaisha: *See*—
Amano, Hidetoshi; Abe, Shinichi; Taura, Mitsuharu; and Mizuno, Toshiaki, 4,543,937, Cl. 123-491.000.
Aoyama, Yasuaki, 4,543,811, Cl. 72-332.000.
Inui, Masaki; and Yasui, Yasuyoshi, 4,543,844, Cl. 74-473.00R.
Inui, Masaki; and Yasui, Yasuyoshi, 4,543,846, Cl. 74-477.000.
Itou, Zyouzi; and Akiyama, Synith, 4,544,380, Cl. 55-80.000.
Katayama, Nobuaki, 4,543,842, Cl. 74-473.00P.
Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; and Matsumoto, Motoki, 4,544,349, Cl. 431-258.000.
Tozuka, Zenzaburo: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,544,751, Cl. 548-127.000.
Traficante, Daniel, to Exxon Research & Engineering Co. Cryogenic production of ammonia synthesis gas. 4,544,390, Cl. 62-20.000.
Tran, Danh C.; Macedo, Pedro B.; Simmons, Joseph H.; Simmons, Catherine J.; and Lagakos, Nicholas, to Macedo, Pedro B.; and Litovitz, Theodore A. Fixation by anion exchange of toxic materials in a glass matrix. 4,544,499, Cl. 252-629.000.
Transducers, Inc.: *See*—
Van Over, William E., 4,543,832, Cl. 73-720.000.
Trayford, Charles, III; and Petrizzi, Jeffrey M., to Environmental Safety Products, Inc. Filter cassette. 4,544,386, Cl. 55-270.000.
Trenco, Inc.: *See*—
Pray, David M., 4,545,062, Cl. 377-6.000.

Trenner, Hans-Herbert, to Colgate-Palmolive Company. Apparatus for filling dispensing containers with a liquid or pasty product. 4,544,006, Cl. 141-105.000.

Trent, Bryan O.: *See—*
Tomlinson, Ronald S.; and Trent, Bryan O., 4,543,892, Cl. 110-203.000.

Triumph-Adler Aktiengesellschaft fur Buro- und Informationstechnik: *See—*
Engemann, Detlef; Fischer, Dieter; and Vatterott, Karl-Heinz, 4,544,842, Cl. 250-227.000.

Trobridge, Gary W.: *See—*
Seffernick, Lewis L.; and Trobridge, Gary W., 4,543,714, Cl. 29-845.000.

Troup, Alan; Strassler, Sigfrid; Guttinger, Hannes; and Pfister, Gustav, to Cerberus AG. Device for the detection of foreign components in a gas and an application of the device. 4,543,815, Cl. 73-28.000.

Trube, Hans: *See—*
Schmidt, Manfred; Trube, Hans; and Pfeiffer, Martin, 4,544,197, Cl. 296-84.00R.

Trustees University of Massachusetts: *See—*
Ryan, Patrick J.; Davis, Michael A.; and Melchior, Donald L., 4,544,545, Cl. 424-1.100.

Trutzschler GmbH & Co. Kg: *See—*
Hackenbeck, Dietmar; and Marx, Hans-Jurgen, 4,544,106, Cl. 241-101.00A.

TRW Cam Gears Limited: *See—*
Adams, Frederick J., 4,544,131, Cl. 251-309.000.
Rogers, Peter R., 4,543,813, Cl. 72-356.000.

TRW Inc.: *See—*
Chan, Daniel F.; and Bucklen, Willard K., 4,544,914, Cl. 340-347.0AD.
Palmer, William B., 4,543,992, Cl. 137-614.000.

Tsai, Min H.: *See—*
Maurer, Robert S.; and Tsai, Min H., 4,544,353, Cl. 433-9.000.

Tsai, Tsu-Tzu; and Arnold, Fred E., to United States of America, Air Force. Method for making heterocyclic block copolymer. 4,544,713, Cl. 525-432.000.

Tschannen, Roland: *See—*
Fraefel, Wolfgang; and Tschannen, Roland, 4,544,552, Cl. 514-23.000.

Tsou, Uh-Po E.: *See—*
Chapman, Orville L.; and Tsou, Uh-Po E., 4,544,782, Cl. 585-443.000.

Tsuchihashi, Michihiro: *See—*
Yamazaki, Hiroyoshi; Minagawa, Yoshiji; Tsuchihashi, Michihiro; Anzai, Yoshinori; and Kajiwara, Toshiro, 4,544,862, Cl. 315-209.00R.

Tsuge, Kazunori; Tawada, Yoshihisa; and Hamakawa, Yoshihiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Amorphous silicon semiconductor and process for same. 4,544,423, Cl. 148-174.000.

Tsuji, Kazuo, to Sumitomo Electric Industries, Ltd. Diamond single crystals, a process of manufacturing and tools for using same. 4,544,540, Cl. 423-446.000.

Tsuji, Sadahiko: *See—*
Tanaka, Kazuo; and Tsuji, Sadahiko, 4,544,250, Cl. 354-199.000.

Tsuji, Shiro: *See—*
Kato, Misao; Shimeki, Yasuharu; Matsushima, Hiroshi; Tsuji, Shiro; Kihara, Nobuyoshi; and Amano, Yoshinori, 4,544,962, Cl. 360-40.000.

Tsukada, Katsushige: *See—*
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, 4,544,625, Cl. 430-284.000.

Tsukamoto, Masaaki, to Nippon Kogaku K.K. Apparatus for displaying information in camera view finder. 4,544,252, Cl. 354-289.100.

Tsushima, Susumu: *See—*
Hozumi, Motoo; Tsushima, Susumu; and Yoshioka, Yoshio, 4,544,512, Cl. 260-925.000.

Tu, Peter J., to AT&T Bell Laboratories. Technique for the transmission of video and audio signals over a digital transmission system. 4,544,950, Cl. 358-143.000.

Tuckey, Charles H., to Walbro Corporation. Pressure regulator with variable response. 4,543,935, Cl. 123-463.000.

Tupack, Robert E.: *See—*
Haglund, Richard A.; and Tupack, Robert E., 4,543,677, Cl. 14-71.500.

Turk, Wolfgang: *See—*
Brombacher, Urs; Montavon, Marc; Bretschneider, Hermann; Schantl, Joachim; and Turk, Wolfgang, 4,544,659, Cl. 514-297.000.

Tweco Products, Inc.: *See—*
Cusick, Joseph B., III, 4,544,827, Cl. 219-137.630.

Twin City Surgical, Inc.: *See—*
Duescher, Wayne O., 4,543,718, Cl. 30-124.000.

Tyson, William H.; and Stuart, Frank A., to Claypro Associates. Recovery of hydrocarbon oil from filter cakes. 4,544,491, Cl. 210-772.000.

Tyynela, Esko; and Pitkanen, Tuomo, to Oy Wartsila Ab. Clutch and transmission mechanism. 4,544,310, Cl. 409-82.000.

Uchiyama, Shigeru: *See—*
Nishiguchi, Yuzuru; Uchiyama, Shigeru; and Kobayashi, Masaaki, 4,544,858, Cl. 310-321.000.

Ueda, Noriyoshi: *See—*
Kitajima, Tadayuki; Hayakawa, Kimiaki; Ueda, Noriyoshi; and Hiroi, Masakazu, 4,544,148, Cl. 271-3.100.

Uenishi, Toshifumi: *See—*
Watanabe, Toshiaki; Uenishi, Toshifumi; Sahara, Hiroshi; and Yamaoka, Katsumi, 4,544,922, Cl. 340-728.000.

Ueno, Hiroshi: *See—*
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,544,648, Cl. 502-119.000.

Uesaka, Yasutaro; Hishiyama, Sadao; Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Fujiwara, Hideo, to Hitachi, Ltd; and Hitachi Maxell, Ltd. Perpendicular magnetic recording medium. 4,544,591, Cl. 428-65.000.

Uesugi, Mitsuaki: *See—*
Yamada, Takeo; Uesugi, Mitsuaki; and Okamura, Masaru, 4,544,268, Cl. 356-394.000.

Ugon, Michel, to CII Honeywell Bull (Societe Anonyme). Process and apparatus for authenticating or certifying at least one item of information contained in a memory of a removable and portable electronic carrier, such as a card. 4,544,833, Cl. 235-379.000.

Ukigai, Toshiyuki; Hagiwara, Masaaki; and Yamada, Junichi, to Lion Corporation. Oil recovery process. 4,544,033, Cl. 166-274.000.

Ulmer, Richard W.; and McKenzie, James A., to Motorola, Inc. Analog switch structure having low leakage current. 4,544,854, Cl. 307-576.000.

Union Carbide Corporation: *See—*
Chao, Chien C.; and Sherman, John D., 4,544,778, Cl. 568-872.000.
Keogh, Michael J., 4,544,760, Cl. 556-40.000.
Litz, Lawrence M., 4,544,207, Cl. 299-5.000.
Maresca, Louis M., 4,544,705, Cl. 525-132.000.
Salensky, George A.; and Fry, John S., 4,544,688, Cl. 523-458.000.

Union Industrial y Agroganadera, S.A. (UNIASA): *See—*
Gil, Angel; and Valverde, Luis, 4,544,559, Cl. 426-72.000.

Union Oil Company of California: *See—*
Biale, John, 4,544,699, Cl. 524-512.000.
Griswold, Charles F.; and Christolini, Ben A., Jr., 4,543,894, Cl. 110-347.000.
Marsh, Glenn A., 4,544,465, Cl. 204-148.000.

Uniroyal, Inc.: *See—*
DeVera, Nedie L., 4,544,702, Cl. 525-66.000.

Unisen, Inc.: *See—*
Pittaway, James W., 4,544,869, Cl. 318-293.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Abdullah, Hilal M.; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Toyne, Kenneth J., 4,544,497, Cl. 252-299.500.

United States of America
Agriculture: *See—*
Bookwalter, George N., 4,544,564, Cl. 426-462.000.
Air Force: *See—*
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,544,713, Cl. 525-432.000.
Army: *See—*
Branovich, Louis E.; Smith, Bernard; and Freeman, Gerard L., 4,544,535, Cl. 423-290.000.
Dixon, Samuel, Jr., 4,545,073, Cl. 455-325.000.
Moyers, Thomas E., 4,544,844, Cl. 250-330.000.
Wortman, Donald E.; Morrison, Clyde A.; and Leavitt, Richard P., 4,545,056, Cl. 372-2.000.
Energy: *See—*
Cremers, David A.; and Keller, Richard A., 4,544,274, Cl. 356-436.000.
Duran, Edward L., 4,544,376, Cl. 51-293.000.
Eoff, James M., 4,544,859, Cl. 310-335.000.
Farnum, Eugene H.; and Fries, R. Jay, 4,544,520, Cl. 376-152.000.
Kucera, Gene H.; and Roche, Michael F., 4,544,614, Cl. 429-193.000.
Poa, David S.; and Yao, Neng-Ping, 4,544,616, Cl. 429-229.000.
Skotheim, Terje A., 4,544,456, Cl. 204-59.00R.
Weil, Bradley S.; and Wetherington, Grady R., Jr., 4,544,839, Cl. 250-205.000.
Health & Human Services: *See—*
Peterson, John I., 4,544,231, Cl. 350-96.150.
National Aeronautics and Space Administration: *See—*
Aldrich, Billy R.; and Whitt, William D., 4,544,025, Cl. 165-65.000.
Cohen, Marc M., 4,544,068, Cl. 211-74.000.
Hepner, Timothy E.; and Meyers, James F., 4,545,025, Cl. 364-728.000.
Navy: *See—*
Karwacki, Francis A., 4,544,891, Cl. 324-304.000.
Shapiro, Wilbur; Graham, Richard W., II; and Anderson, Hugh G., Jr., 4,544,285, Cl. 384-99.000.
Tims, Allan C.; and Henriquez, Theodore A., 4,545,041, Cl. 367-157.000.

U.S. Philips Corporation: *See—*
De Haan, Gerard, 4,544,918, Cl. 340-347.0AD.
Elkerbout, Marten F.; and Kloosterhof, Leonardus P. A., 4,544,278, Cl. 366-129.000.
Guest, Andrew J.; and Washington, Derek, 4,544,860, Cl. 313-103.0CM.
Jansen, Gerardus L. M.; and Vorspaget, Alexander, 4,545,046, Cl. 369-111.000.
Kammerer, Walter; and Spiro, Vladimir, 4,545,049, Cl. 370-16.000.
Meyer, Wolfgang, 4,543,831, Cl. 73-705.000.
Mota, Joaquim S., 4,544,906, Cl. 336-206.000.
Mudde, Leo M., 4,545,005, Cl. 363-68.000.
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; and Sanders, Georgius B. J., 4,544,806, Cl. 179-115.5PV.

Seuter, Antonius M. J. H.; and van den Boom, Petrus F. J., 4,544,997, Cl. 362-263.000.
Stoker, Albert, 4,544,895, Cl. 330-273.000.
van Baardewijk, Johannes; Bohlmeyer, Nicolaas; and Hartman, Johan E. A., 4,545,050, Cl. 370-62.000.
Van De Bult, Oelke, 4,544,973, Cl. 360-106.000.
United Steel & Wire Company: *See—*
Kellogg, Guy, 4,544,171, Cl. 280-33.99A.
United Technologies Corporation: *See—*
Posluszny, Thomas; and Oliver, Oscar, Sr., 4,545,027, Cl. 364-724.000.
Veltri, Richard D.; and Galasso, Francis S., 4,544,412, Cl. 106-286.500.
Warburton, Robert E., 4,544,098, Cl. 239-127.300.
Unitek Corporation: *See—*
Maurer, Robert S.; and Tsai, Min H., 4,544,353, Cl. 433-9.000.
Universal Instruments Corporation: *See—*
Porterfield, Richard; Soth, Henry J.; and Biesecker, Douglas A., 4,543,705, Cl. 29-566.300.
University College of Swansea, The: *See—*
Lansdown, Anthony R., 4,544,017, Cl. 164-472.000.
University de Reims Champagne Ardenne: *See—*
Michel, Troyon E., 4,544,845, Cl. 250-396.00R.
University of California, The Regents of the: *See—*
Chapman, Orville L.; and Tsou, Uh-Po E., 4,544,782, Cl. 585-443.000.
Ferrari, Leonard A., 4,543,826, Cl. 73-602.000.
Siegel, Robert C., 4,544,638, Cl. 435-273.000.
University of Delaware: *See—*
Barnett, Allen M., 4,544,799, Cl. 136-262.000.
University Patents, Inc.: *See—*
Goepp, Robert A.; and Freese, Uwe E., 4,543,949, Cl. 128-127.000.
UOP Inc.: *See—*
Kurek, Paul R.; Engel, Dusan J.; and Fergin, Richard L., 4,544,796, Cl. 585-856.000.
Up-Right, Inc.: *See—*
Horn, Darrell C.; and Fletcher, Jeffery N., 4,543,775, Cl. 56-235.000.
Upjohn Company, The: *See—*
Aristoff, Paul A., 4,544,764, Cl. 560-56.000.
Upson, Donald A.; and Steklenski, David J., to Eastman Kodak Company. Vinyl acetate polymers and latex compositions containing same. 4,544,723, Cl. 524-347.000.
Urban Engineering Co., Inc.: *See—*
Kleinberg, Larry K.; and Evans, Don S., 4,543,857, Cl. 76-101.00R.
USS Engineers & Consultants, Inc.: *See—*
Bates, Kenneth W.; and Watts, Norman H., 4,543,981, Cl. 137-315.000.
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, to Mizusawa Industrial Chemicals, Ltd. Heat-sensitive recording paper and filler therefor. 4,544,604, Cl. 428-402.000.
Utagawa, Ken, to Nippon Kogaku K. K. Focus detector. 4,544,255, Cl. 354-406.000.
Val Products, Inc.: *See—*
Steudler, Frederick W., Jr., 4,543,912, Cl. 119-18.000.
Valentine, Daniel R.: *See—*
Freund, Robert F.; and Valentine, Daniel R., 4,544,184, Cl. 283-94.000.
Valeo: *See—*
Cadars, Patrick, 4,544,029, Cl. 165-149.000.
Valverde, Luis: *See—*
Gil, Angel; and Valverde, Luis, 4,544,559, Cl. 426-72.000.
Van Doorne's Transmissie B.V.: *See—*
Svab, Eugen; van Deursen, Petrus H.; and Cadee, Theodorus P. M., 4,543,852, Cl. 74-695.000.
van Baardewijk, Johannes; Bohlmeyer, Nicolaas; and Hartman, Johan E. A., to U.S. Philips Corporation. Method of and arrangement for establishing a conference connection in a TDM communication system. 4,545,050, Cl. 370-62.000.
van Berkel, Johannes; and Ruyters, Wilhelmus N., to Shell Internationale Research Maatschappij B.V. Process for preparing cyclopropane carboxylic acid ester derivatives. 4,544,510, Cl. 260-465.00D.
VanBreemen, Bertram, to RCA Corporation. Vertical color shift correction in a rear projection television screen. 4,544,946, Cl. 358-60.000.
Van Buren, Phillip D.; and Abt, Edgar J., to Motorola, Inc. Fast indexing encoder apparatus. 4,544,913, Cl. 340-347.00P.
Van De Bult, Oelke, to U.S. Philips Corporation. Swing-arm arrangement for a magnetic disc storage apparatus. 4,544,973, Cl. 360-106.000.
van den Boom, Petrus F. J.: *See—*
Seuter, Antonius M. J. H.; and van den Boom, Petrus F. J., 4,544,997, Cl. 362-263.000.
van der Sanden, John A. Valve for pressurized containers. 4,543,980, Cl. 137-315.000.
van Deursen, Petrus H.: *See—*
Svab, Eugen; van Deursen, Petrus H.; and Cadee, Theodorus P. M., 4,543,852, Cl. 74-695.000.
van Gijsel, Wilhelmus D. A. M.: *See—*
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; and Sanders, Georgius B. J., 4,544,806, Cl. 179-115.5PV.
Van Meter, James A. Key ring attachment. 4,543,860, Cl. 81-488.000.
Van Over, William E., to Transducers, Inc. Overload protected pressure transducer. 4,543,832, Cl. 73-720.000.
Van Veen, Onno; and Knobloch, Dale B., to Jonas Brothers, Inc. Artificial animal jaw. 4,544,361, Cl. 434-296.000.
Varian Associates, Inc.: *See—*
Taylor, Norman J., 4,544,847, Cl. 250-396.0ML.
Varitronic Systems, Inc.: *See—*
McGourty, Thomas K.; and McGourty, Lawrence F., 4,544,289, Cl. 400-154.500.
Varker, Kenneth J.: *See—*
Solomon, Joseph M.; and Varker, Kenneth J., 4,544,439, Cl. 156-626.000.
Vatterott, Karl-Heinz: *See—*
Engemann, Detlef; Fischer, Dieter; and Vatterott, Karl-Heinz, 4,544,842, Cl. 250-227.000.
VDO Adolf Schindling AG: *See—*
Nickol, Friedrich W., 4,544,238, Cl. 350-336.000.
Veintraub, David: *See—*
Pack, Isak; Veintraub, David; Yarkoni, Abraham; and Merchuk, Josef, 4,543,965, Cl. 128-748.000.
Veit GmbH & Co.: *See—*
Zerhoch, Georg; Sauter, Josef; Kiederle, Richard; and von Stein, Gunther, 4,543,739, Cl. 38-15.000.
Veltri, Richard D.; and Galasso, Francis S., to United Technologies Corporation. Deposition of improved SiC coatings on carbon-base materials. 4,544,412, Cl. 106-286.500.
Venkatesan, Srinivasan; Pinsky, Naum; and Sapru, Krishna, to Energy Conversion Devices, Inc. Hydrogen sulfide decomposition cell and catalytic materials therefor. 4,544,461, Cl. 204-128.000.
Verber, Carl M., to Battelle Development Corporation. Apparatus for evaluating a polynomial function using an array of optical modules. 4,544,229, Cl. 350-96.140.
Vernitron Corporation: *See—*
North, Howard L., Jr., 4,543,748, Cl. 49-395.000.
Vianova Kunstharz, A.G.: *See—*
Paar, Willibald; and Schipfer, Rudolf, 4,544,715, Cl. 525-528.000.
Vickers PLC: *See—*
Moore, Derek S., 4,544,244, Cl. 350-520.000.
Victor Company of Japan, Ltd.: *See—*
Ogata, Haruki, 4,544,970, Cl. 360-94.000.
Visser, Arie, to XSI General Partnership. Extrema coding signal processing method and apparatus. 4,545,065, Cl. 381-41.000.
Vista Chemical Company: *See—*
Ware, Joseph W., III; DeBernardi, James A.; and Holcomb, James R., 4,544,350, Cl. 431-285.000.
Vitins, Janis, to BBC Brown, Boveri & Company, Limited. Electronic chopper circuit and a method of operation. 4,545,006, Cl. 363-124.000.
Vlahos, Stephanie A. Blackboard eraser handle. 4,543,680, Cl. 15-145.000.
Voege, Herbert: *See—*
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.
Voegeli, Ronald C. Newspaper display machine. 4,544,081, Cl. 221-155.000.
Voest-Alpine Aktiengesellschaft: *See—*
Fohler, Johann, 4,543,838, Cl. 73-864.310.
Scheurecker, Werner; Holzer, Karl; Engel, Kurt; and Schubert, Hermann, 4,544,015, Cl. 164-442.000.
Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel, to Basf Aktiengesellschaft. Vitamin E intermediates and methods for the preparation of (2R,4'RS,8'RS)-α-tocopherol and (all-rac)-α-tocopherol via the new intermediate products. 4,544,758, Cl. 549-407.000.
Vogel, Richard E.; and Bowsky, Benjamin, to Emerson Electric Co. Degradation sensing and shut-down means for refrigeration motor-compressor units. 4,543,797, Cl. 62-193.000.
Voirin, Robert: *See—*
Dupin, Thierry; and Voirin, Robert, 4,544,534, Cl. 423-230.000.
Volk, Joseph A.: *See—*
Volk, Joseph A., Jr.; and Volk, Joseph A., 4,543,835, Cl. 73-861.730.
Volk, Joseph A., Jr.; and Volk, Joseph A., to Beta II, Incorporated. Dry flow sensor with a linear force transducer. 4,543,835, Cl. 73-861.730.
Volkswagenwerk Aktiengesellschaft: *See—*
Danckert, Hermann, 4,544,299, Cl. 403-150.000.
Oetting, Hermann; Heidemeyer, Paulus; and Zimmermann, Frank, 4,543,855, Cl. 74-859.000.
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, to Bayer Aktiengesellschaft. Ectoparasiticide-containing polyurethanes. 4,544,547, Cl. 424-14.000.
von Gizyoki, Ulrich: *See—*
von Bittera, Miklos; Dorn, Hubert; Schapel, Dietmar; Stendal, Wilhelm; Voege, Herbert; Federman, Manfred; and von Gizyoki, Ulrich, 4,544,547, Cl. 424-14.000.
von Hiddessen, Gotz; and Wachtel, Dieter, to Daimler-Benz Aktiengesellschaft. Mounting of a differential gear in an undivided axle housing. 4,543,853, Cl. 74-713.000.
von Seggern, Ernest. Two cycle engine with dynamic stratification and method of operation therefor. 4,543,928, Cl. 123-262.000.
von Stein, Gunther: *See—*
Zerhoch, Georg; Sauter, Josef; Kiederle, Richard; and von Stein, Gunther, 4,543,739, Cl. 38-15.000.
Vorspaget, Alexander: *See—*
Jansen, Gerardus L. M.; and Vorspaget, Alexander, 4,545,046, Cl. 369-111.000.

Voss, Charles V. Apparatus and method for use in detonating a pipe-conveyed perforating gun. 4,544,035, Cl. 166-299.000.
Vossen, Franz, to Meurer Druck & Carton GmbH. Sheet processing apparatus. 4,544,367, Cl. 493-1.000.
VSI Corporation: *See—*
Stencel, Edgar L., 4,544,312, Cl. 411-3.000.
W. Schlafhorst & Co.: *See—*
Wassenhoven, Heinz-Georg, 4,543,779, Cl. 57-401.000.
WABCO Fahrzeugbremsen GmbH: *See—*
Klatt, Alfred, 4,543,856, Cl. 74-866.000.
WABCO Westinghouse Steuerungstechnik GmbH: *See—*
Bachmann, Wilhelm; and Kemner, Axel, 4,543,975, Cl. 137-85.000.
Wachs, Israel; and Chersich, Claudio C., to Exxon Research and Engineering Co. Catalysts comprising tantala supported on titania. 4,544,649, Cl. 502-350.000.
Wachtel, Dieter: *See—*
von Hiddessen, Gotz; and Wachtel, Dieter, 4,543,853, Cl. 74-713.000.
Wada, Katsuhiko, to Satoh Seiki Co., Ltd.; and Elsol Product Corp. Fully automatic method and apparatus for assembling stick-type cosmetics. 4,543,702, Cl. 29-434.000.
Wada, Takeshi; Kita, Hisanao; Wada, Tatsuji; Fujishima, Susumu; and Kadowaki, Hironori, to Hitachi, Ltd. System for automatically inserting U-tubes of heat exchanger or the like. 4,543,711, Cl. 29-726.000.
Wada, Tatsuji: *See—*
Wada, Takeshi; Kita, Hisanao; Wada, Tatsuji; Fujishima, Susumu; and Kadowaki, Hironori, 4,543,711, Cl. 29-726.000.
Wade, Wallace R.: *See—*
Rao, Vemulapalli D. N.; and Wade, Wallace R., 4,544,388, Cl. 55-282.000.
Wagner, Kuno: *See—*
Muller, Peter; Wagner, Kuno; Wegner, Christian; and Schwabe, Peter, 4,544,683, Cl. 523-111.000.
Wahlefeld, August W.: *See—*
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Wakabayashi Patent Agency: *See—*
Ema, Kenji; Saito, Jun; Mitsuishi, Takatoshi; and Ikado, Shuhei, 4,544,727, Cl. 526-313.000.
Wakasa, Jack Y.: *See—*
Calvin, John H.; and Wakasa, Jack Y., 4,543,993, Cl. 137-614.030.
Waki, Masahiko: *See—*
Suzuki, Hirofumi; Waki, Masahiko; and Harada, Kunimitsu, 4,544,288, Cl. 400-121.000.
Waknine, Samuel, to Pentron Corporation. Dental restorative material. 4,544,359, Cl. 433-199.000.
Walberg, Arvid C. Material for filtering spray coating particles from air. 4,543,908, Cl. 118-326.000.
Walbro Corporation: *See—*
Tuckey, Charles H., 4,543,935, Cl. 123-463.000.
Walker, John G. Self-trimming sailset. 4,543,899, Cl. 114-39.000.
Walker, John H.; and Wood, Harold V., to Phillips Petroleum Company. Stamp molded paraffin scraper. 4,544,701, Cl. 524-609.000.
Walker, Loren H., to General Electric Company. Thyristor voltage limiter for current source inverter. 4,545,002, Cl. 363-37.000.
Wallace, Leslie E.: *See—*
Finch, Charles R.; Wallace, Leslie E.; and Evans, Thomas E., 4,544,706, Cl. 525-146.000.
Wallach, Steven J.: *See—*
Clancy, Gerald F.; Schleimer, Stephen I.; Mundie, Craig J.; Wallach, Steven J.; Bratt, Richard G.; and Gavrin, Edward S., 4,545,012, Cl. 364-200.000.
Wallenbrock, Craig; and Perry, Leroy R., Jr., to Perry, Leroy R., Jr. Exercise device with stretchable elastomeric line. 4,544,155, Cl. 272-136.000.
Walter, Kurt; Gokorsch, Wilfried; Kurth, Gunter; Grusdt, Rainer; and Schreiter, Manfred. Apparatus for producing and charging containers in a sterile atmosphere. 4,543,770, Cl. 53-511.000.
Wang, Chao-Huei J.; and Jolley, Michael E., to Abbott Laboratories. Fluorescent nucleic acid stains. 4,544,546, Cl. 424-7.100.
Wantshouse, Richard A.: *See—*
Balliet, Layton; Wantshouse, Richard A.; and Wylie, Thomas J., 4,545,074, Cl. 455-601.000.
Warburton, Robert E., to United Technologies Corporation. Cooled exhaust nozzle flaps. 4,544,098, Cl. 239-127.300.
Ward, David R.; and Zieske, William E., to Kysor Industrial Corporation. Temperature control for vehicle cabin. 4,543,795, Cl. 62-158.000.
Ware, Frederick A., to Hewlett-Packard Company. Partial product accumulation in high performance multipliers. 4,545,028, Cl. 364-760.000.
Ware, Joseph W., III; DeBernardi, James A.; and Holcomb, James R., to Vista Chemical Company. Burner apparatus for simultaneously incinerating liquid, dry gas and wet gas streams. 4,544,350, Cl. 431-285.000.
Warman, Thomas E.; Baker, Gordon P.; and Smith, James E., to Sencorp. Elastomeric driver return assembly for an electro-mechanical fastener driving tool. 4,544,090, Cl. 227-131.000.
Warner & Swasey Company, The: *See—*
Kwon, Ki C.; and Luther, Thomas A., 4,544,211, Cl. 308-6.00C.
Washington, Derek: *See—*
Guest, Andrew J.; and Washington, Derek, 4,544,860, Cl. 313-103.0CM.
Wassenhoven, Heinz-Georg, to W. Schlafhorst & Co. Spinning device. 4,543,779, Cl. 57-401.000.
Watanabe, Eiji: *See—*
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, 4,544,414, Cl. 106-287.240.
Watanabe, Haruo: *See—*
Ichiryu, Ken; Watanabe, Haruo; and Yamaguchi, Takashi, 4,544,129, Cl. 251-129.010.
Watanabe, Masaki: *See—*
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,543,849, Cl. 74-501.50R.
Watanabe, Toshiaki; Uenishi, Toshifumi; Sahara, Hiroshi; and Yamaoka, Katsumi, to Sony Corporation. Smoothing circuit for display apparatus. 4,544,922, Cl. 340-728.000.
Watanabe, Yoshitaka; and Endo, Takashi, to Canon Kabushiki Kaisha. Liquid jet recording apparatus. 4,544,931, Cl. 346-140.00R.
Water Services of America, Inc.: *See—*
Baron, Walter J., 4,543,996, Cl. 137-625.430.
Baron, Walter J., 4,544,026, Cl. 165-95.000.
Watts, Norman H.: *See—*
Bates, Kenneth W.; and Watts, Norman H., 4,543,981, Cl. 137-315.000.
Weaver, John R., II; and McClure, Nathaniel D., to General Motors Corporation. Method for more uniformly spacing features in a lateral bipolar transistor. 4,544,940, Cl. 357-35.000.
Webasto-Werk W. Baier GmbH & Co.: *See—*
Gruber, Reinhold; and Rathel, Dieter, 4,543,943, Cl. 126-350.00R.
Weber, Georg: *See—*
Romer, Michael; Krause, Joachim; and Weber, Georg, 4,544,771, Cl. 568-329.000.
Weber, Hans-Leo: *See—*
Claussen, Uwe; Hannes, Hellmut; and Weber, Hans-Leo, 4,544,583, Cl. 428-1.000.
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, to Carl Still GmbH & Co. KG, Firma. Apparatus with two-stage heating for carbonizing cold-compacted briquettes. 4,544,451, Cl. 202-114.000.
Webster, Henry G.; and Bainbridge, Wilfred N., to Automotive Products plc. Rotary transmission. 4,544,057, Cl. 192-0.076.
Webster, Owen W.: *See—*
Sogah, Dotsevi Y.; and Webster, Owen W., 4,544,724, Cl. 526-279.000.
Wecker, Dietmar; and Lippold, Heinrich, to IBP Pietzsch GmbH. Determination and passing on of a target direction for tanks. 4,543,727, Cl. 33-228.000.
Wedemeyer, Karlfried: *See—*
Heise, Klaus-Peter; Kuth, Robert; Neufang, Karl; Pantke, Hellmuth; and Wedemeyer, Karlfried, 4,544,372, Cl. 8-602.000.
Wegner, Christian: *See—*
Muller, Peter; Wagner, Kuno; Wegner, Christian; and Schwabe, Peter, 4,544,683, Cl. 523-111.000.
Weh, Erwin; and Weh, Wolfgang. Pipe coupling having line pressure actuated threaded segments. 4,543,995, Cl. 137-614.060.
Weh, Wolfgang: *See—*
Weh, Erwin; and Weh, Wolfgang, 4,543,995, Cl. 137-614.060.
Wehmeyer, Gunter: *See—*
Ziegenhorn, Joachim; Roder, Albert; Bartl, Knut; and Wehmeyer, Gunter, 4,544,630, Cl. 435-11.000.
Weil, Bradley S.; and Wetherington, Grady R., Jr., to United States of America, Energy. Laser beam monitoring system. 4,544,839, Cl. 250-205.000.
Weiler, Paul: *See—*
Kessler, Peter-Jurgen; Mayer, Jurgen; and Weiler, Paul, 4,543,682, Cl. 15-250.420.
Weimann, Gunter: *See—*
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.
Weirich, Walter; and Peters, Bernd, to Gewerkschaft Eisenhutte Westfalia. Hydraulic coupling device. 4,544,185, Cl. 285-137.00R.
Weiss, Sydney J.: *See—*
Murray, John D.; and Weiss, Sydney J., 4,544,886, Cl. 324-158.00F.
Weldon, William F.; and Gully, John H., to Board of Regents, The University of Texas, The. Homopolar generator power supply system. 4,544,874, Cl. 322-10.000.
Welzenbach, Manfred: *See—*
Hauk, Waldemar; Krull, Klaus; and Welzenbach, Manfred, 4,545,048, Cl. 370-1.000.
Wenger, John L.: *See—*
Papandrea, James J.; and Wenger, John L., 4,543,806, Cl. 70-30.000.
Werner & Pfleiderer: *See—*
Gnadig, Gerhard; and Kuklinski, Siegfried, 4,544,341, Cl. 425-192.00R.
Rudolph, Joachim, 4,544,279, Cl. 366-132.000.
Wernicke & Co. GmbH: *See—*
Kotting, Fritz, 4,543,752, Cl. 51-277.000.
Werz, Jakob F.; and Munk, Edmund, to Werzalit-Werke J. F. Werz KG. Device for the manufacture of pressed profiled bodies. 4,544,342, Cl. 425-193.000.
Werzalit-Werke, J.F.Werz KG: *See—*
Munk, Edmund, 4,544,344, Cl. 425-324.100.
Werz, Jakob F.; and Munk, Edmund, 4,544,342, Cl. 425-193.000.
West, Bradford D., Jr.; and Berchtold, Jean, to Eastman Kodak Company. Alumina glass composition and magnetic head incorporating same. 4,544,974, Cl. 360-120.000.

Westberg, Russell C. Boring head centering apparatus. 4,544,308, Cl. 408-82.000.
Western Geophysical Co. of America: *See—*
Savit, Carl H., 4,545,039, Cl. 367-39.000.
Westinghouse Electric Corp.: *See—*
Basnett, Robert T., 4,544,817, Cl. 200-293.000.
Blewitt, Donald D.; and Gupta, Tapan K., 4,544,908, Cl. 337-279.000.
Clarke, Rowland C.; and Eldridge, Graeme W., 4,544,417, Cl. 148-1.500.
Clements, Jack W.; and Faulkner, John R., 4,545,018, Cl. 364-474.000.
Lenhoff, John G., Jr., 4,544,917, Cl. 340-347.0AD.
O'Sullivan, William T.; and Pace, Earl C., 4,543,891, Cl. 110-185.000.
Scott, Julian C., 4,543,730, Cl. 33-366.000.
Westlund, Arnold E., Jr.: *See—*
Fraley, Lawrence R.; and Westlund, Arnold E., Jr., 4,545,000, Cl. 362-304.000.
Westvaco Corporation: *See—*
Alford, John A.; Force, Carlton G.; and Gowan, John W., Jr., 4,544,726, Cl. 526-309.000.
Wetherington, Grady R., Jr.: *See—*
Weil, Bradley S.; and Wetherington, Grady R., Jr., 4,544,839, Cl. 250-205.000.
Wetzel, Rodney J.; and Stout, Gregg W., to Baker Oil Tools, Inc. Method of field assembly of a selected number of shaped charges in a well casing perforating gun. 4,543,703, Cl. 29-455.00R.
Wheeler, Douglas J.: *See—*
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., 4,544,457, Cl. 204-67.000.
Wheeler, Robert G. Method of manufacturing an embossed product. 4,544,440, Cl. 156-634.000.
Whirlpool Corporation: *See—*
Buckleitner, Thomas H., 4,544,056, Cl. 192-71.000.
White, Charles, Jr.: *See—*
Jones, John O., Jr.; and White, Charles, Jr., 4,544,867, Cl. 318-129.000.
White Consolidated Industries, Inc.: *See—*
Mawby, Harold S.; and Johnston, Burdith W., 4,543,800, Cl. 62-339.000.
White, Kenneth B.; Richmond, James M.; and Stanley, Keith D., to Akzona Incorporated. Quaternary ammonium compounds and method for their manufacture. 4,544,506, Cl. 260-462.00R.
Whitney, Charles A.: *See—*
Damiano, Ralph R.; and Whitney, Charles A., 4,543,716, Cl. 29-871.000.
Whitt, William D.: *See—*
Aldrich, Billy R.; and Whitt, William D., 4,544,025, Cl. 165-65.000.
Wiedeburg, Klaus, to Siemens Aktiengesellschaft. Method and arrangement for controlling a light switch for optical signals. 4,545,078, Cl. 455-600.000.
Wiegers, Ben W.: *See—*
Chou, Eddie C.; Wiegers, Ben W.; Huggins, Dale K.; and Wiewiorowski, Edward I., 4,544,541, Cl. 423-508.000.
Wieme, Samuel P.; and Williams, Robert, to Sun Chemical Corporation. Adjustable digital encoder. 4,544,915, Cl. 340-347.00P.
Wier, Donald R.; and Gillham, Gordon D., to Phillips Petroleum Company. Slug-type in situ recovery of mineral values. 4,544,206, Cl. 299-4.000.
Wieselman, Alex; and Prince, Leonard D. Illuminating telescopic device. 4,544,990, Cl. 362-32.000.
Wiewiorowski, Edward I.: *See—*
Chou, Eddie C.; Wiegers, Ben W.; Huggins, Dale K.; and Wiewiorowski, Edward I., 4,544,541, Cl. 423-508.000.
Wild, Jurgen: *See—*
Lauer, Gerhard; Morawietz, Alfred; and Wild, Jurgen, 4,543,726, Cl. 33-180.00R.
Wildman, Timothy C.: *See—*
Aiello, Richard E.; Moist, Stanford C., Jr.; Poleshuk, Robert J.; and Wildman, Timothy C., 4,544,220, Cl. 339-59.00M.
Wilkeson, Charles N. Liquid dispenser and grooming brush for animals. 4,543,913, Cl. 119-85.000.
Wilkinson, Noel R., to Robert Morton DG Limited. Mixers. 4,544,281, Cl. 366-325.000.
Willaschek, Horst: *See—*
Glasmeyer, Ulrich; and Willaschek, Horst, 4,544,405, Cl. 75-51.200.
William H. Rorer, Inc.: *See—*
Studt, William L.; Dodson, Stuart A.; Zimmerman, Harry K.; and Barnes, James L., 4,544,670, Cl. 514-617.000.
Williams, Aaron T. Throat guard apparatus. 4,544,357, Cl. 433-136.000.
Williams, Robert: *See—*
Skrypek, John P.; Williams, Robert; Dominico, James W.; and Rohr, Albin, 4,543,883, Cl. 101-38.00A.
Wieme, Samuel P.; and Williams, Robert, 4,544,915, Cl. 340-347.00P.
Willis, Donald E., to Bristol-Myers Company. Bottle-overcap combination. 4,544,073, Cl. 215-246.000.
Wilson, Stanley E., to Shell Oil Company. Catalytic isomerization of tertiary olefins. 4,544,780, Cl. 585-377.000.
Winchell, David F.: *See—*
Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., 4,544,804, Cl. 179-18.0BC.
Windsor Medical, Inc.: *See—*
O'Boyle, Matthew, 4,544,329, Cl. 417-53.000.
Winter, Roland A. E.: *See—*
Dexter, Martin; and Winter, Roland A. E., 4,544,691, Cl. 524-99.000.
Wiremold Company, The: *See—*
Damiano, Ralph R.; and Whitney, Charles A., 4,543,716, Cl. 29-871.000.
Wirtz, John W.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,544,014, Cl. 164-429.000.
Wirtz Manufacturing Company, Inc.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,544,014, Cl. 164-429.000.
Rader, Robert R., 4,543,863, Cl. 83-76.000.
Wise, Mark J.: *See—*
Graef, Harry T.; Hill, Jeffrey A.; Mercer, Scott A.; Newton, Kevin H.; Sedlock, Gerald T.; and Wise, Mark J., 4,544,149, Cl. 271-107.000.
Wise, Paul H.: *See—*
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,544,162, Cl. 273-242.000.
Wiseman, John A., to Simplimatic Engineering Co. Case opening apparatus. 4,543,767, Cl. 53-76.000.
Withers, Howard P.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,544,785, Cl. 585-500.000.
Woebcke, Herman N.: *See—*
Gartside, Robert J.; and Woebcke, Herman N., 4,544,480, Cl. 208-127.000.
Wohl, Ronald A.: *See—*
Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., 4,544,654, Cl. 514-210.000.
Wohl, Wilhelm: *See—*
Diepholz, Tilo; Hapke, Walter; Wohl, Wilhelm; and Schindler, H.-Joachim, 4,544,965, Cl. 360-71.000.
Wolfe, Eddie B. Automatic rewinding water hose reel. 4,543,982, Cl. 137-355.200.
Wolfram, Joachim W., to Ethyl Corporation. Preparation of halo-α-keto-carboxylic acids. 4,544,505, Cl. 260-413.000.
Womack, James A.: *See—*
Long, Jerry M.; and Womack, James A., 4,544,213, Cl. 312-183.000.
Wombles, Robert H.; Carlos, Donald D.; and Gannon, Charles R., to Ashland Oil, Inc. Method and composition of asphaltic roofing fluxes. 4,544,411, Cl. 106-279.000.
Wong, Thomas: *See—*
Krill, Wayne V.; Wong, Thomas; and Gotterba, James, 4,543,940, Cl. 126-92.0AC.
Wood, Harold V.: *See—*
Walker, John H.; and Wood, Harold V., 4,544,701, Cl. 524-609.000.
Wood, Robin: *See—*
Brittain, David R.; and Wood, Robin, 4,544,662, Cl. 514-374.000.
Woodward, Fred. Sunscreen thermal and frame assembly. 4,544,012, Cl. 160-90.000.
Wortel, Theodorus M., to Exxon Research & Engineering Co. Zeolite L with cylindrical morphology. 4,544,539, Cl. 423-328.000.
Wortman, Donald E.; Morrison, Clyde A.; and Leavitt, Richard P., to United States of America, Army. Depressed collector/ribbon electron beam analyzer for a diffraction radiation generator. 4,545,056, Cl. 372-2.000.
Wright, Bernard S.: *See—*
Daviduk, Nicholas; Owen, Hartley; and Wright, Bernard S., 4,544,788, Cl. 585-501.000.
Wright, Philip M.; and Didier, Donald, to General Can Company, Inc. Closure having reinforced pull tab. 4,544,080, Cl. 220-359.000.
Wright, Roy F., to Phillips Petroleum Company. Poly(arylene sulfide) composition containing an ethylene polymer. 4,544,700, Cl. 524-543.000.
Wrigley, Robert A., to Detroit Marine Engineering, Inc. Adjustable boat seat. 4,544,199, Cl. 297-244.000.
Wulczynski, Frank J.: *See—*
McCollough, William L.; and Wulczynski, Frank J., 4,544,523, Cl. 419-8.000.
Wylie, Thomas J.: *See—*
Balliet, Layton; Wantshouse, Richard A.; and Wylie, Thomas J., 4,545,074, Cl. 455-601.000.
Xenpax, Inc.: *See—*
Coone, Malcolm G., 4,544,165, Cl. 277-34.000.
Xerox Corporation: *See—*
Kermisch, Dorian, 4,545,069, Cl. 382-46.000.
Kolbe, James R., 4,544,260, Cl. 355-3.0BE.
Kopko, John J., 4,544,618, Cl. 430-102.000.
Mort, Joseph; Jansen, Frank; Grammatica, Steven J.; and Morgan, Michael A., 4,544,617, Cl. 430-58.000.
Powers, Edward A., 4,544,265, Cl. 355-76.000.
Raus, Robert W.; and Stewart, Sam E., 4,544,225, Cl. 339-91.00R.
XSI General Partnership: *See—*
Visser, Arie, 4,545,065, Cl. 381-41.000.
Yabunaka, Kiyoshi: *See—*
Hamano, Isao; Yabunaka, Kiyoshi; Akae, Yoshifumi; Tanaka, Toshinori; Gotou, Takeo; and Matsumoto, Kouichi, 4,543,923, Cl. 123-179.00F.
Yamada, Junichi: *See—*
Ukigai, Toshiyuki; Hagiwara, Masaaki; and Yamada, Junichi, 4,544,033, Cl. 166-274.000.
Yamada, Kaneo; Okamoto, Shigemi; and Asada, Kazuhiko, to Kabushiki Kaisha Kobe Seiko Sho. Uniform distributor apparatus for a gaseous and liquid phase fluid. 4,544,514, Cl. 261-153.000.

Yamada, Shigeru: *See*—
Kawashima, Susumu; and Yamada, Shigeru, 4,543,869, Cl. 84-1.010.

Yamada, Tadayuki: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,545,070, Cl. 382-48.000.

Yamada, Takeo; Uesugi, Mitsuaki; and Okamura, Masaru, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for detecting flaw on threads of male screw. 4,544,268, Cl. 356-394.000.

Yamaguchi, Hiroji; Hayashi, Masaharu; and Itakura, Masato, to Aisin Seiki Kabushiki Kaisha. Temperature-responsive fluid coupling device. 4,544,053, Cl. 192-58.00B.

Yamaguchi, Noboru: *See*—
Tabata, Mitsuo; Kidode, Masatsugu; and Yamaguchi, Noboru, 4,545,068, Cl. 382-41.000.

Yamaguchi, Nobutaka; Iida, Shinobu; Okutu, Toshimitu; Miyoshi, Takahito; Tadokoro, Eiichi; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,544,601, Cl. 428-330.000.

Yamaguchi, Takashi: *See*—
Ichiryu, Ken; Watanabe, Haruo; and Yamaguchi, Takashi, 4,544,129, Cl. 251-129.010.

Yamaguchi, Yoshiko: *See*—
Owada, Fumio; and Yamaguchi, Yoshiko, 4,544,934, Cl. 346-154.000.

Yamamoto, Hiroshi, to Shimadzu Corporation. Densitometer. 4,544,271, Cl. 356-328.000.

Yamamoto, Kazuyoshi: *See*—
Moriki, Yasumitsu; Sato, Tadashi; Yamamoto, Kazuyoshi; and Takahashi, Izumi, 4,543,818, Cl. 73-49.800.

Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Automatic adjusting device for actuating mechanism and its control wire. 4,543,849, Cl. 74-501.50R.

Yamamoto, Takashi: *See*—
Nishida, Kozi; and Yamamoto, Takashi, 4,544,235, Cl. 350-96.340.

Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, to Aichi Steel Works, Ltd.; and Chuo Hatsujo Kabushiki Kaisha. Spring steel having a good sag-resistance and a good hardenability. 4,544,406, Cl. 75-123.00N.

Yamamoto, Yoshio: *See*—
Matsui, Isamu; Yamamoto, Yoshio; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimamoto, Akira, 4,544,107, Cl. 242-35.50A.

Yamamura, Yuichi; and Kishimoto, Tadamitsu. Human T cell lines and method of producing same. 4,544,632, Cl. 435-68.000.

Yamaoka, Hideyoshi: *See*—
Ohta, Kenji; Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,544,443, Cl. 156-643.000.

Yamaoka, Katsumi: *See*—
Watanabe, Toshiaki; Uenishi, Toshifumi; Sahara, Hiroshi; and Yamaoka, Katsumi, 4,544,922, Cl. 340-728.000.

Yamasawa, Akira: *See*—
Itami, Teruhiko; Kimoto, Toshifumi; Yamasawa, Akira; and Saitoh, Koichi, 4,544,574, Cl. 427-48.000.

Yamashita, Youhachi; Takahashi, Takashi; and Harata, Mituo, to Tokyo Shibaura Denki Kabushiki Kaisha. High dielectric constant type ceramic composition. 4,544,644, Cl. 501-134.000.

Yamazaki, Hiroyoshi; Minagawa, Yoshiji; Tsuchihashi, Michihiro; Anzai, Yoshinori; and Kajiwara, Toshiro, to Mitsubishi Denki Kabushiki Kaisha. Lighting circuit for electric discharge lamp. 4,544,862, Cl. 315-209.00R.

Yamazaki, Yasuyoshi: *See*—
Okado, Hideo; Hashimoto, Kazuo; Kawamura, Kichinari; Yamazaki, Yasuyoshi; and Takaya, Haruo, 4,544,793, Cl. 585-640.000.

Yan, Tsoung-Yuan, to Mobil Oil Corporation. Recovery of metal values from petroleum residua and other fractions. 4,544,479, Cl. 208-106.000.

Yano, Seiki: *See*—
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Suyama, Takahiro; and Yano, Seiki, 4,545,057, Cl. 372-45.000.

Yao, Neng-Ping: *See*—
Poa, David S.; and Yao, Neng-Ping, 4,544,616, Cl. 429-229.000.

Yarkoni, Abraham: *See*—
Pack, Isak; Veintraub, David; Yarkoni, Abraham; and Merchuk, Josef, 4,543,965, Cl. 128-748.000.

Yasui, Yasuyoshi: *See*—
Inui, Masaki; and Yasui, Yasuyoshi, 4,543,844, Cl. 74-473.00R.
Inui, Masaki; and Yasui, Yasuyoshi, 4,543,846, Cl. 74-477.000.

Yasui, Yoshiharu: *See*—
Seiki, Kazuo; Suzuki, Yoshihisa; and Yasui, Yoshiharu, 4,543,776, Cl. 57-261.000.

Yats, Larry D.: *See*—
Pickelman, Dale M.; and Yats, Larry D., 4,544,697, Cl. 524-458.000.

Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,544,454, Cl. 203-51.000.

Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., to Phillips Petroleum Company. Olefin polymerization. 4,544,718, Cl. 526-141.000.

Yetselev, Zinovy N.; and Martynov, Genrich I. Continuous casting process and apparatus. 4,544,016, Cl. 164-467.000.

Ying-Ming, Tsai; Hsiao-Ming, Chen; and Gann, Ting, to Institute of Nuclear Energy Research. Separation process for the recovery of uranium from wet-process phosphoric acid. 4,544,530, Cl. 423-10.000.

Yokoi, Naoki, to Fuji Xerox Co., Ltd. Heat-sensitive recording sheet. 4,544,936, Cl. 346-209.000.

Yokono, Hitoshi: *See*—
Nate, Kazuo; Inoue, Takashi; Yokono, Hitoshi; Ishikawa, Mitsuo; and Kumada, Makoto, 4,544,729, Cl. 528-28.000.

Yolton, Charles F.; and Moll, John H., to Crucible Materials Corporation. Method for atomizing titanium. 4,544,404, Cl. 75-0.50C.

Yoshida, Eiichi: *See*—
Sasaki, Koji; Yoshida, Eiichi; and Sawaki, Akira, 4,544,263, Cl. 355-14.00E.

Yoshida, Hirokazu: *See*—
Nakabu, Shigeo; Matsuda, Yuji; Yoshida, Hirokazu; Iwasaki, Masaru; Nukii, Takashi; and Awane, Katunobu, 4,544,989, Cl. 361-401.000.

Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, to Yoshida Kogyo K.K. Method of attaching a separable slide fastener to knit fabrics. 4,543,805, Cl. 66-148.000.

Yoshida Kogyo K. K.: *See*—
Kaminaga, Hiromitsu; and Kondo, Hiroshi, 4,543,756, Cl. 52-284.000.

Yoshida Kogyo K.K.: *See*—
Yoshida, Hiroshi; Matsuda, Yoshio; and Akashi, Shunji, 4,543,805, Cl. 66-148.000.

Yoshida, Shigeru; Shiraishi, Norihisa; Asakawa, Chosei; and Sakaguchi, Morohira, to Kawasaki Steel Corporation. Rotary hearth finish annealing furnace. 4,544,142, Cl. 266-252.000.

Yoshida, Tomio: *See*—
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,545,044, Cl. 369-32.000.

Yoshida, Yasuharu, to NEC Corporation. DC Voltage control circuits. 4,544,894, Cl. 329-122.000.

Yoshimura, Fumikatsu: *See*—
Ishii, Osamu; Yoshimura, Fumikatsu; and Hatakeyama, Iwao, 4,544,612, Cl. 428-692.000.

Yoshinaga, Minoru; and Matsubara, Nobuyuki, to Toray Industries, Inc. Package of carbonaceous filament strand. 4,544,113, Cl. 242-178.000.

Yoshioka, Yoshio: *See*—
Hozumi, Motoo; Tsushima, Susumu; and Yoshioka, Yoshio, 4,544,512, Cl. 260-925.000.

Yoshisato, Akiyuki, to Alps Electric Co., Ltd. Video clamping circuit. 4,544,951, Cl. 358-172.000.

Yoshizaki, Masanori: *See*—
Matsubara, Kazunori; Yoshizaki, Masanori; Mifune, Takao; Nakamura, Kenichi; Endo, Yukio; Takamatsu, Hidetoshi; Saito, Yutaka; and Kawana, Takeshi, 4,543,708, Cl. 29-598.000.

Young, Jorge A.; and Khandwala, Bhupendra J., to Figgie International, Inc. Card reader with buffer for degraded mode. 4,544,832, Cl. 235-377.000.

Younger, Steven K.; and Fiedelak, Rudolf A. Foldable head rest. 4,544,203, Cl. 297-391.000.

Yurchak, Sergei: *See*—
Chao, Paul K.; Knob, Kevin J.; and Yurchak, Sergei, 4,544,781, Cl. 585-408.000.

Zaman, Mohammad K.: *See*—
Drapala, Thaddeus R.; and Zaman, Mohammad K., 4,545,077, Cl. 455-612.000.

Zanno, Paul R.: *See*—
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., 4,544,566, Cl. 426-548.000.

Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,544,658, Cl. 514-254.000.

Zeller, Paul: *See*—
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,544,655, Cl. 514-222.000.

Zemke, Anne, legal representative: *See*—
Zemke, Edward H., deceased; Pogue, Harold D.; Shah, Girish B.; and Bowles, Myron A., 4,544,146, Cl. 270-58.000.

Zemke, Edward H., deceased (by Zemke, Anne, legal representative); Pogue, Harold D.; Shah, Girish B.; and Bowles, Myron A., to Bell & Howell Company. Insertion machine with control signals stored on searchable medium. 4,544,146, Cl. 270-58.000.

Zentner, Mark R.; and Cutler, Orvid R., to DeSoto, Inc. Method of making thermally curable wet-impregnated rovings. 4,543,777, Cl. 57-295.000.

Zerhoch, Georg; Sauter, Josef; Kiederle, Richard; and von Stein, Gunther, to Veit GmbH & Co. Steam ironing station. 4,543,739, Cl. 38-15.000.

Ziegenhorn, Joachim; Roder, Albert; Bartl, Knut; and Wehmeyer, Gunter, to Boehringer Mannheim GmbH. Process for specific determination of cholesterol in the presence of the HDL fraction in serum. 4,544,630, Cl. 435-11.000.

Ziegenhorn, Joachim: *See*—
Rauscher, Elli; Neumann, Ulrich; Wahlefeld, August W.; Hagen, Alexander; Gruber, Wolfgang; Ziegenhorn, Joachim; Schaich, Eugen; Deneke, Ulfert; Michal, Gerhard; and Weimann, Gunter, 4,544,631, Cl. 435-14.000.

Ziegler, Rudolf: *See*—
Hartmann, Rolf; Krah, Albrecht; Egle, Hilda; and Ziegler, Rudolf, 4,544,441, Cl. 156-634.000.

Zieske, William E.: *See*—
Ward, David R.; and Zieske, William E., 4,543,795, Cl. 62-158.000.

Zimmer, Darrel E.: *See*—
Clemmons, Richard R.; Zimmer, Darrel E.; and Sanders, Stephen H., III, 4,544,866, Cl. 318-54.000.

Zimmerman, Harry K.: *See*—
Studt, William L.; Dodson, Stuart A.; Zimmerman, Harry K.; and Barnes, James L., 4,544,670, Cl. 514-617.000.
Zimmermann, Frank: *See*—
Oetting, Hermann; Heidemeyer, Paulus; and Zimmermann, Frank, 4,543,855, Cl. 74-859.000.
Zinke, Horst; and Schumacher, Rolf, to Ciba-Geigy Corporation. Lubricant compositions. 4,544,492, Cl. 252-32.70E.
Ziv, Avraham, to American Safety Equipment Corporation. Safety belt webbing emergency locking apparatus. 4,544,112, Cl. 242-107.200.
Zoecon Corporation: *See*—
Anderson, Richard J.; and Leippe, Michael M., 4,544,400, Cl. 71-90.000.
Zones, Stacey I., to Chevron Research Company. Zeolite SSZ-13 and its method of preparation. 4,544,538, Cl. 423-326.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Automation Industries, Inc.: *See*—
Ball, David J., Re. 31,995, Cl. 339-113.00R.

Ball, David J., to Automation Industries, Inc. Enhanced detent guide track with dog-leg. Re. 31,995, Cl. 339-113.00R.

Klotzner, Winfried, to Robert Bosch GmbH. Input-output unit for a microprocessor engine control system. Re. 31,997, Cl. 364-431.120.

Kurai, Nobuyoshi: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hagime; and Suzuki, Sadahide, Re. 31,994, Cl. 180-225.000.

Nippon Electric Co., Ltd.: *See*—
Sato, Hisaaki, Re. 31,996, Cl. 315-3.500.

Robert Bosch GmbH: *See*—
Klotzner, Winfried, Re. 31,997, Cl. 364-431.120.

Sato, Hisaaki, to Nippon Electric Co., Ltd. Traveling wave tube devices. Re. 31,996, Cl. 315-3.500.

Suzuki, Sadahide: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hagime; and Suzuki, Sadahide, Re. 31,994, Cl. 180-225.000.

Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hagime; and Suzuki, Sadahide, to Yamaha Hatsudoki Kabushiki Kaisha. Intake system for motorcycle engines having V-shaped cylinder arrangement. Re. 31,994, Cl. 180-225.000.

Ueno, Hagime: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hagime; and Suzuki, Sadahide, Re. 31,994, Cl. 180-225.000.

Wesch, William E., Jr. Cylinder gripping apparatus. Re. 31,993, Cl. 73-498.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hagime; and Suzuki, Sadahide, Re. 31,994, Cl. 180-225.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bertschi, Ernst, to ICOMAG Trust Reg. Hair-curling implement. B1 4,327,753, 10-1-85, Cl. 132-40.000.

Dunchock, Richard S., to SL Container Corporation. Storage cart. B1 8,265,517, 10-1-85, Cl. D34-17.000.

ICOMAG Trust Reg.: *See*—
Bertschi, Ernst, B1 4,327,753, Cl. 132-40.000.

SL Container Corporation: *See*—
Dunchock, Richard S., B1 8,265,517, Cl. D34-17.000.

LIST OF DESIGN PATENTEES

Accessory Sales, Inc.: *See*—
Jordan, David J., 280,795, Cl. D8-14.000.

Akiyama, Kunio: *See*—
Nishibori, Hiroshi; and Akiyama, Kunio, 280,819, Cl. D14-100.000.

Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., to AT&T Technologies, Inc. Housing for a telephone. 280,816, 10-1-85, Cl. D14-63.000.

Allied Corporation: *See*—
Thakar, David, 280,833, Cl. D18-24.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,783, Cl. D3-71.000.

Ammco Tools, Inc.: *See*—
Clark, Christopher G.; and Spainhour, Phillip A., 280,827, Cl. D15-199.000.

Arjani, Farouk: *See*—
Winters, Robert; and Arjani, Farouk, 280,820, Cl. D14-106.000.

AT&T Technologies, Inc.: *See*—
Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., 280,816, Cl. D14-63.000.

Bakic, Dieter, to Revlon, Inc. Cosmetic case. 280,852, 10-1-85, Cl. D28-83.000.

Bakic, Dieter, to Revlon, Inc. Cosmetic case. 280,853, 10-1-85, Cl. D28-83.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,783, Cl. D3-71.000.

Benedict, Charles E., to Telescoping Tie Racks, Inc. Extendable tie rack housing with cover. 280,785, 10-1-85, Cl. D6-324.000.

Berge, Gary; and Ludzia, Leo, to Williams Electronics, Inc. Video game cabinet. 280,835, 10-1-85, Cl. D21-13.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 280,787, Cl. D6-381.000.

Bisbee, Michael O. Warm-up suit or the like. 280,775, 10-1-85, Cl. D2-29.000.

Black & Decker, Inc.: *See*—
Somers, Robert I., 280,796, Cl. D8-61.000.

Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, to American Tourister, Inc. Soft-sided wheeled suitcase. 280,783, 10-1-85, Cl. D3-71.000.

Bulgari, Gianni, to Ditta Sotirio Bulgari di Constantino e Giorgia Bulgari S.a. Letter opener. 280,798, 10-1-85, Cl. D8-102.000.

Century Boat Company: *See*—
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 280,808, Cl. D12-314.000.

Chalberg, Philip E. Pump support bracket for a jetted whirlpool bath. 280,800, 10-1-85, Cl. D8-380.000.

Cho, Joong H. Bottle cap for edible oil. 280,802, 10-1-85, Cl. D9-446.000.

Clark, Christopher G.; and Spainhour, Phillip A., to Ammco Tools, Inc. Tire changer. 280,827, 10-1-85, Cl. D15-199.000.

Clover, William M., Jr. Automobile audio speaker enclosure. 280,818, 10-1-85, Cl. D14-34.000.

Cooper, Marvin, to Dynamic Classics Ltd. Garment bag. 280,782, 10-1-85, Cl. D3-71.000.

Curtis Manufacturing Company, Inc.: *See*—
Judd, Thomas W.; and Resker, Gregory F., 280,822, Cl. D14-114.000.

Custom Shade and Awning Corporation: *See*—
Fairbanks, Lyman N., 280,792, Cl. D6-575.000.

Deemer, Milton G. Multiple dental x-ray mount. 280,828, 10-1-85, Cl. D16-26.000.

deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, to Multigood B.V. Painting tool. 280,784, 10-1-85, Cl. D4-122.000.

DeWitt, Kenneth: *See*—
Thornton, Ian; DeWitt, Kenneth; and Robertson, Simon, 280,793, Cl. D7-43.000.

Ditta Sotirio Bulgari di Constantino e Giorgia Bulgari S.a.: *See*—
Bulgari, Gianni, 280,798, Cl. D8-102.000.

Diversified Products Corporation: *See*—
Kelley, Robert C.; and Silberman, Ira J., 280,843, Cl. D21-191.000.

Doorley, Daniel: *See*—
deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, 280,784, Cl. D4-122.000.

Dozsa Farkas, Andreas, to Johannes Buchsteiner GmbH & Co. KG. Storage Cabinet. 280,791, 10-1-85, Cl. D6-559.000.

Dynamic Classics Ltd.: *See—*
Cooper, Marvin, 280,782, Cl. D3-71.000.

Dzitzer, Max. Physical exerciser. 280,840, 10-1-85, Cl. D21-191.000.

Dzitzer, Max. Physical exerciser. 280,841, 10-1-85, Cl. D21-191.000.

Ebro Espalier Limited, Ebro Orchards: *See—*
Evans, Eric R., 280,794, Cl. D8-1.000.

Evans, Eric R., to Ebro Espalier Limited, Ebro Orchards. Cross arm for an espalier frame. 280,794, 10-1-85, Cl. D8-1.000.

Evert, Karla R., to Evert, Karla R. Sailboarding personal flotation vest. 280,844, 10-1-85, Cl. D21-238.000.

Evert, Karla R., to Evert, Karla R. Personal flotation vest. 280,845, 10-1-85, Cl. D21-238.000.

Fairbanks, Lyman N., to Custom Shade and Awning Corporation. Drapery module unit for doors, windows, and the like. 280,792, 10-1-85, Cl. D6-575.000.

Fuller, John M.; and Maza, Dale T., to Rubbermaid Commercial Products Inc. Dome top for a waste receptacle. 280,857, 10-1-85, Cl. D34-11.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Athletic shoe with pocket. 280,776, 10-1-85, Cl. D2-309.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Athletic shoe with wrap-around pocket. 280,777, 10-1-85, Cl. D2-310.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed boot. 280,778, 10-1-85, Cl. D2-310.000.

Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, to Shape Inc. Tape cassette. 280,815, 10-1-85, Cl. D14-11.000.

Gelardi, John: *See—*
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 280,815, Cl. D14-11.000.

General Corporation, The: *See—*
Mineta, Kunihiko, 280,832, Cl. D18-7.000.

Gravity Guidance, Inc.: *See—*
Miller, Jack V., 280,842, Cl. D21-191.000.

Gulf Coast Aqua Leisure Corporation: *See—*
Wolfe, Henry S., 280,809, Cl. D12-316.000.

Hardy, Sophia; and Wilson, John H. G. Portable self-contained surveillance and detection device. 280,804, 10-1-85, Cl. D10-75.000.

Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., to Century Boat Company. Boat hull. 280,808, 10-1-85, Cl. D12-314.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Mikado, Yoshio, 280,824, Cl. D15-12.000.

Hsu, Shin-chen. Detachable side luggage case for motorcycle. 280,806, 10-1-85, Cl. D12-158.000.

Interlego AG: *See—*
Tapdrup, Erik P.; and Olsen, Gert P., 280,838, Cl. D21-90.000.

Ishaya, Romeo M.: *See—*
Ludzia, Leo F.; and Ishaya, Romeo M., 280,836, Cl. D21-13.000.

Janome Sewing Machine Co. Ltd.: *See—*
Kuroki, Nobufusa, 280,826, Cl. D15-69.000.

Johannes Buchsteiner GmbH & Co. KG: *See—*
Dozsa Farkas, Andreas, 280,791, Cl. D6-559.000.

Jordan, David J., to Accessory Sales, Inc. Rivet tool similar article. 280,795, 10-1-85, Cl. D8-14.000.

Judd, Thomas W.; and Resker, Gregory F., to Curtis Manufacturing Company, Inc. Computer pedestal. 280,822, 10-1-85, Cl. D14-114.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Takei, Masaharu, 280,837, Cl. D21-64.000.

Kaiser, Elmar. Combined vehicle ornament and advertising device. 280,807, 10-1-85, Cl. D12-197.000.

Kangaroos U.S.A., Inc.: *See—*
Gamm, Robert J., 280,776, Cl. D2-309.000.
Gamm, Robert J., 280,777, Cl. D2-310.000.
Gamm, Robert J., 280,778, Cl. D2-310.000.

Keebler Company: *See—*
Thornton, Ian; DeWitt, Kenneth; and Robertson, Simon, 280,793, Cl. D7-43.000.

Kelley, Robert C.; and Silberman, Ira J., to Diversified Products Corporation. Horizontal sit-up exerciser. 280,843, 10-1-85, Cl. D21-191.000.

Kidde, Inc.: *See—*
Ohno, Richard, 280,799, Cl. D8-302.000.

Kooy, Hermen. Refrigerated display case for flowers or the like. 280,790, 10-1-85, Cl. D6-471.000.

Kuroki, Nobufusa, to Janome Sewing Machine Co. Ltd. Sewing machine. 280,826, 10-1-85, Cl. D15-69.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Yoshimura, Reijiro, 280,801, Cl. D9-367.000.

La Rue Distributors, Inc.: *See—*
Thomas, Suzanne, 280,780, Cl. D3-48.000.

Landry, Vincent: *See—*
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 280,815, Cl. D14-11.000.

Laws, Wallace H. Bowling glove. 280,779, 10-1-85, Cl. D2-361.000.

Lekhtman, David, to Mitel Corporation. Video display terminal. 280,821, 10-1-85, Cl. D14-106.000.

Levin, Gus. Combined accessory tray and book support for use in bath tubs, beds or the like. 280,788, 10-1-85, Cl. D6-406.000.

Levoy, Barton M. Eyeglasses. 280,830, 10-1-85, Cl. D16-113.000.

Levoy, Barton M. Eyeglasses. 280,831, 10-1-85, Cl. D16-116.000.

Long, Stapleton, to Berkline Corporation, The. Seat. 280,787, 10-1-85, Cl. D6-381.000.

Ludzia, Leo: *See—*
Berge, Gary; and Ludzia, Leo, 280,835, Cl. D21-13.000.

Ludzia, Leo F.; and Ishaya, Romeo M., to Williams Electronics, Inc. Video game cabinet. 280,836, 10-1-85, Cl. D21-13.000.

Maddock, Mitchell E. In-line transparent dripper valve. 280,847, 10-1-85, Cl. D23-22.000.

Makowski, Lloyd S.: *See—*
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 280,808, Cl. D12-314.000.

Maruyama, Eiki, to Maruyama Industrial Co. Ltd. Dry battery driven liquid pump. 280,823, 10-1-85, Cl. D15-7.000.

Maruyama Industrial Co. Ltd.: *See—*
Maruyama, Eiki, 280,823. Cl. D15-7.000.

Matalon, Norma. Fragrance container. 280,854, 10-1-85, Cl. D28-91.100.

Maza, Dale T.: *See—*
Fuller, John M.; and Maza, Dale T., 280,857, Cl. D34-11.000.

Merino, Michael B., deceased; and by Merino, Ronald A., executor. Decorative light display. 280,850, 10-1-85, Cl. D26-102.000.

Merino, Ronald A., executor: *See—*
Merino, Michael B., deceased; and Merino, Ronald A., executor, 280,850, Cl. D26-102.000.

Meyer, Donald R., to Union Special Corporation. Sewing machine. 280,825, 10-1-85, Cl. D15-69.000.

Michelson, Allen L. Waste receptacle. 280,856, 10-1-85, Cl. D34-5.000.

Migliore, John: *See—*
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,783, Cl. D3-71.000.

Mikado, Yoshio, to Honda Giken Kogyo Kabushiki Kaisha. Cultivator. 280,824, 10-1-85, Cl. D15-12.000.

Miller, Jack V., to Gravity Guidance, Inc. Full body weight traction device. 280,842, 10-1-85, Cl. D21-191.000.

Mineta, Kunihiko, to General Corporation, The. Electronic calculator or similar article. 280,832, 10-1-85, Cl. D18-7.000.

Mitel Corporation: *See—*
Lekhtman, David, 280,821, Cl. D14-106.000.

Mitsui, Tadashi, to T.D.K. Corp. Ferrite core. 280,810, 10-1-85, Cl. D13-4.000.

Monobe, Juzaburo: *See—*
Sakamoto, Masakazu; Numata, Teruhisa; and Monobe, Juzaburo, 280,797, Cl. D8-68.000.

Moore, Marvin F., to Thermalloy Incorporated. Heat sink or similar article. 280,811, 10-1-85, Cl. D13-23.000.

Muellner, James M.; and Pastien, Eugene R., to Smarte Carte, Inc. Shopping cart. 280,858, 10-1-85, Cl. D34-18.000.

Muller, Ronald L.; and Rakocy, William J., to North American Philips Corporation. Digital scale. 280,805, 10-1-85, Cl. D10-92.000.

Muller, Ronald L.; and Rakocy, William J., to North American Philips Corporation. Wall-mounted hair dryer. 280,851, 10-1-85, Cl. D28-12.000.

Multigood B.V.: *See—*
deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, 280,784, Cl. D4-122.000.

Murphy, Edwin R., Jr. Table. 280,789, 10-1-85, Cl. D6-455.000.

Nihill, Barbara A. Contoured fabric doll head. 280,839, 10-1-85, Cl. D21-190.000.

Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See—*
Ohashi, Shigeo, 280,814, Cl. D13-38.000.

Nintendo Co., Ltd.: *See—*
Yokoi, Gunpei, 280,834, Cl. D21-13.000.

Nishibori, Hiroshi; and Akiyama, Kunio, to Sharp Corporation. Personal computer. 280,819, 10-1-85, Cl. D14-100.000.

North American Philips Corporation: *See—*
Muller, Ronald L.; and Rakocy, William J., 280,805, Cl. D10-92.000.
Muller, Ronald L.; and Rakocy, William J., 280,851, Cl. D28-12.000.
Rapp, Harold B.; and Towne, Herbert, 280,813, Cl. D13-28.000.

Numata, Teruhisa: *See—*
Sakamoto, Masakazu; Numata, Teruhisa; and Monobe, Juzaburo, 280,797, Cl. D8-68.000.

Ofield, Michael G. Motorcycle light indicator. 280,849, 10-1-85, Cl. D26-28.000.

Ohashi, Shigeo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Push button switch. 280,814, 10-1-85, Cl. D13-38.000.

Ohno, Richard, to Kidde, Inc. Combined alarm exit latch and lock therefor. 280,799, 10-1-85, Cl. D8-302.000.

Ohtsuji, Tetsuo, to Pioneer Electronic Corporation. Loudspeaker. 280,817, 10-1-85, Cl. D14-30.000.

Olsen, Gert P.: *See—*
Tapdrup, Erik P.; and Olsen, Gert P., 280,838, Cl. D21-90.000.

Ott, John P. Baseball equipment cart. 280,859, 10-1-85, Cl. D34-25.000.

Pardo, John: *See—*
Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., 280,816, Cl. D14-63.000.

Pastien, Eugene R.: *See—*
Muellner, James M.; and Pastien, Eugene R., 280,858, Cl. D34-18.000.

Peterson, Robert T. Dial face for electronic timepiece. 280,803, 10-1-85, Cl. D10-39.000.

Phares, James S.: *See—*
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 280,808, Cl. D12-314.000.

Pioneer Electronic Corporation: *See—*
Ohtsuji, Tetsuo, 280,817, Cl. D14-30.000.

Pitney Bowes Inc.: *See—*
Winters, Robert; and Arjani, Farouk, 280,820, Cl. D14-106.000.

Platner, Warren. Lounge chair. 280,786, 10-1-85, Cl. D6-366.000.

Pruneau, Diane: *See*—
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 280,815, Cl. D14-11.000.

Pulichino, John: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,783, Cl. D3-71.000.

Rakocy, William J.: *See*—
Muller, Ronald L.; and Rakocy, William J., 280,805, Cl. D10-92.000.
Muller, Ronald L.; and Rakocy, William J., 280,851, Cl. D28-12.000.

Rapp, Harold B.; and Towne, Herbert, to North American Philips Corporation. Electrical outlet. 280,813, 10-1-85, Cl. D13-28.000.

Reil, Vladimir. Hygenic carrier for stud gun components. 280,848, 10-1-85, Cl. D24-25.000.

Resker, Gregory F.: *See*—
Judd, Thomas W.; and Resker, Gregory F., 280,822, Cl. D14-114.000.

Revlon, Inc.: *See*—
Bakic, Dieter, 280,852, Cl. D28-83.000.
Bakic, Dieter, 280,853, Cl. D28-83.000.

Robertson, Simon: *See*—
Thornton, Ian; DeWitt, Kenneth; and Robertson, Simon, 280,793, Cl. D7-43.000.

Rubbermaid Commercial Products Inc.: *See*—
Fuller, John M.; and Maza, Dale T., 280,857, Cl. D34-11.000.

Rubel, Kenneth L. Photographic light bracket. 280,829, 10-1-85, Cl. D16-47.000.

Ryobi Ltd.: *See*—
Sakamoto, Masakazu; Numata, Teruhisa; and Monobe, Juzaburo, 280,797, Cl. D8-68.000.
Sakamoto, Masakazu; and Shohoji, Takeshi, 280,846, Cl. D22-25.000.

Sakamoto, Masakazu; Numata, Teruhisa; and Monobe, Juzaburo, to Ryobi Ltd. Portable electric drill. 280,797, 10-1-85, Cl. D8-68.000.

Sakamoto, Masakazu; and Shohoji, Takeshi, to Ryobi Limited. Fishing reel. 280,846, 10-1-85, Cl. D22-25.000.

Shape Inc.: *See*—
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 280,815, Cl. D14-11.000.

Sharp Corporation: *See*—
Nishibori, Hiroshi; and Akiyama, Kunio, 280,819, Cl. D14-100.000.

Shohoji, Takeshi: *See*—
Sakamoto, Masakazu; and Shohoji, Takeshi, 280,846, Cl. D22-25.000.

Silberman, Ira J.: *See*—
Kelley, Robert C.; and Silberman, Ira J., 280,843, Cl. D21-191.000.

Smarte Carte, Inc.: *See*—
Muellner, James M.; and Pastien, Eugene R., 280,858, Cl. D34-18.000.

Smith, Morley L., to T. S. Simms & Co., Limited. Paint tray having support legs. 280,855, 10-1-85, Cl. D32-53.100.

Snyder, Martin H.: *See*—
Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., 280,816, Cl. D14-63.000.

Somers, Robert I., to Black & Decker, Inc. Electric hand drill. 280,796, 10-1-85, Cl. D8-61.000.

Spainhour, Phillip A.: *See*—
Clark, Christopher G.; and Spainhour, Phillip A., 280,827, Cl. D15-199.000.

Stanley Electric Co., Ltd.: *See*—
Takahashi, Kaoru, 280,812, Cl. D13-24.000.

T.D.K. Corp.: *See*—
Mitsui, Tadashi, 280,810, Cl. D13-4.000.

T. S. Simms & Co., Limited: *See*—
Smith, Morley L., 280,855, Cl. D32-53.100.

Takahashi, Kaoru, to Stanley Electric Co., Ltd. Light-emitting diode semiconductor chip with leads. 280,812, 10-1-85, Cl. D13-24.000.

Takei, Masaharu, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Toy music box. 280,837, 10-1-85, Cl. D21-64.000.

Tapdrup, Erik P.; and Olsen, Gert P., to Interlego AG. Toy air plane. 280,838, 10-1-85, Cl. D21-90.000.

Telescoping Tie Racks, Inc.: *See*—
Benedict, Charles E., 280,785, Cl. D6-324.000.

Thakar, David, to Allied Corporation. Font of alphanumeric characters. 280,833, 10-1-85, Cl. D18-24.000.

Thermalloy Incorporated: *See*—
Moore, Marvin F., 280,811, Cl. D13-23.000.

Thomas, Suzanne, to La Rue Distributors, Inc. Carrying case. 280,780, 10-1-85, Cl. D3-48.000.

Thornton, Ian; DeWitt, Kenneth; and Robertson, Simon, to Keebler Company. Dough mold. 280,793, 10-1-85, Cl. D7-43.000.

Tijssen, Zwier: *See*—
deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, 280,784, Cl. D4-122.000.

Towne, Herbert: *See*—
Rapp, Harold B.; and Towne, Herbert, 280,813, Cl. D13-28.000.

Union Special Corporation: *See*—
Meyer, Donald R., 280,825, Cl. D15-69.000.

Williams Electronics, Inc.: *See*—
Berge, Gary; and Ludzia, Leo, 280,835, Cl. D21-13.000.
Ludzia, Leo F.; and Ishaya, Romeo M., 280,836, Cl. D21-13.000.

Wilson, John H. G.: *See*—
Hardy, Sophia; and Wilson, John H. G., 280,804, Cl. D10-75.000.

Winters, Robert; and Arjani, Farouk, to Pitney Bowes Inc. CRT work station. 280,820, 10-1-85, Cl. D14-106.000.

Wolfe, Henry S., to Gulf Coast Aqua Leisure Corporation. Float. 280,809, 10-1-85, Cl. D12-316.000.

Yokoi, Gunpei, to Nintendo Co., Ltd. Table top electronic game housing. 280,834, 10-1-85, Cl. D21-13.000.

Yoshimura, Reijiro, to Kyowa Hakko Kogyo Co., Ltd. Bottle. 280,801, 10-1-85, Cl. D9-367.000.

Zarganis, Charles J. Storage case for baby teeth. 280,781, 10-1-85, Cl. D3-66.000.

LIST OF PLANT PATENTEES

B. V. Handelskwekerij/M. C. van Staaveren: *See*—
van Andel, Jacob, 5,565, Cl. 73.000.

Bennett, Cecelia L. D. Miniature rose plant—Fair Dinkum. 5,564, 10-1-85, Cl. 7.000.

Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Joy. 5,566, 10-1-85, Cl. 74.000.

Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Sunup. 5,567, 10-1-85, Cl. 79.000.

Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Dawn. 5,568, 10-1-85, Cl. 79.000.

van Andel, Jacob, to B. V. Handelskwekerij/M. C. van Staaveren. Carnation named Stanoct. 5,565, 10-1-85, Cl. 73.000.

Yoder Brothers, Inc.: *See*—
Duffett, William E., 5,566, Cl. 74.000.
Duffett, William E., 5,567, Cl. 79.000.
Duffett, William E., 5,568, Cl. 79.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 1, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

13 4,543,667
48 4,543,668
84 4,543,669
85 4,543,670
158 4,543,671
321 4,543,672

CLASS 4

415 4,543,674

CLASS 5

37 R 4,543,675

CLASS 6

550 4,543,791

CLASS 8

149.1 4,543,676
602 4,544,372
639 4,544,373

CLASS 14

71.5 4,543,677

CLASS 15

56 4,543,678
110 4,543,679
145 4,543,680
163 4,543,681
250.42 4,543,682
256.6 4,543,683
309 4,543,684

CLASS 16

35 R 4,543,685
288 4,543,686
388 4,543,687

CLASS 17

44.3 4,543,688
46 4,543,689

CLASS 19

300 4,543,690

CLASS 24

20 R 4,543,691
616 4,543,692
640 4,543,693
656 4,543,694
662 4,543,695

CLASS 28

206 4,543,696
246 4,543,697

CLASS 29

10 4,543,698
24.5 4,543,699
426.4 4,543,700
432.1 4,543,701
434 4,543,702
455 R 4,543,703
458 4,543,704
566.3 4,543,705
571 4,543,706
578 4,543,707
598 4,543,708
613 4,543,710
726 4,543,711
825 4,543,712
837 4,543,713
845 4,543,714
852 4,543,715
871 4,543,716

CLASS 30

90.6 4,543,717
124 4,543,718
134 4,543,719
216 4,544,366
272 R 4,543,720
287 4,543,721
360 4,543,722
381 4,543,723

CLASS 33

1 N 4,543,724
178 E 4,543,725
180 R 4,543,726
228 4,543,727
265 4,543,728
293 4,543,729
366 4,543,730
375 4,543,731
502 4,543,732

CLASS 34

1 4,543,733
5 4,543,734
15 4,543,735
46 4,543,736
92 4,543,737

CLASS 36

117 4,543,738

CLASS 38

15 4,543,739

CLASS 40

315 4,543,740

CLASS 42

68 4,543,741

CLASS 43

43.16 4,543,742

CLASS 47

1.5 4,543,743
17 4,543,744
33 4,543,745

CLASS 48

114 4,544,374
197 R 4,544,375

CLASS 49

118 4,543,746
249 4,543,747
395 4,543,748

CLASS 51

33 W 4,543,749
50 R 4,543,750
181 R 4,543,751
277 4,543,752
293 4,544,376
298 4,544,377

CLASS 52

15 4,543,753
218 4,543,754
235 4,543,755
284 4,543,756
295 4,543,757
410 4,543,758
475 4,543,759
544 4,543,760
655 4,543,761
660 4,543,762
698 4,543,763
746 4,543,764
747 4,543,765

CLASS 53

64 4,543,766
76 4,543,767
117 4,543,768
450 4,543,769
511 4,543,770
520 4,543,771

CLASS 54

2 4,543,772

CLASS 55

68 4,544,378
71 4,544,379
80 4,544,380
89 4,544,381
107 4,544,382
129 4,544,383
180 4,544,384
208 4,544,385
270 4,544,386
274 4,544,387
282 4,544,388
302 4,544,389

CLASS 56

13.6 4,543,773
98 4,543,774
235 4,543,775

CLASS 57

261 4,543,776
295 4,543,777
303 4,543,778
401 4,543,779
406 4,543,780

CLASS 60

39.281 4,543,782
39.36 4,543,781
226.2 4,543,783
262 4,543,784
263 4,543,785
435 4,543,786
444 4,543,787
531 4,543,788
545 4,543,789
547.1 4,543,790

CLASS 62

6 4,543,792
4,543,793
20 4,544,390
54 4,543,794
158 4,543,795
160 4,543,796
193 4,543,797
239 4,543,798
283 4,543,799
339 4,543,800
457 4,543,801
525 4,543,802
541 4,544,391

CLASS 63

2 4,543,803
12 4,543,804

CLASS 65

1 4,544,392
6 4,544,393
27 4,544,394
60.3 4,544,395
178 4,544,396
332 4,544,397

CLASS 66

148 4,543,805

CLASS 70

30 4,543,806
34 4,543,807

CLASS 71

88 4,544,398
4,544,399
90 4,544,400
92 4,544,401
93 4,544,402

CLASS 72

137 4,543,808
150 4,543,809
245 4,543,810
332 4,543,811
354 4,543,812
356 4,543,813

CLASS 73

1 C 4,543,814
28 4,543,815
37.6 4,543,816
40.5 A 4,543,817
49.8 4,543,818
64.2 4,543,819
84 4,543,820
153 4,543,821
170 A 4,543,822
304 C 4,543,823
386 4,543,824
459 4,543,825
498 Re.31,993
602 4,543,826
4,543,827
626 4,543,828
4,543,829
660 4,543,830
705 4,543,831
720 4,543,832
741 4,543,833
861.05 4,543,834
861.73 4,543,835
861.85 4,543,836
862.63 4,543,837
864.31 4,543,838

CLASS 74

98 4,543,839
342 4,543,840
461 4,543,841
473 P 4,543,842
473 R 4,543,843
4,543,844
477 4,543,845
4,543,846
480 R 4,543,847
493 4,543,848
501.5 R 4,543,849
512 4,543,850
531 4,543,851
695 4,543,852
713 4,543,853
4,543,854
859 4,543,855
866 4,543,856

CLASS 75

0.5 AB 4,544,403
0.5 C 4,544,404
51.2 4,544,405
123 N 4,544,406
130 A 4,544,407

CLASS 76

101 R 4,543,857

CLASS 81

64 4,543,858
484 4,543,859
488 4,543,860

CLASS 82

4 C 4,543,861

CLASS 83

19 4,543,862
76 4,543,863
91 4,543,864
146 4,543,865
471.3 4,543,866
502 4,543,867
713 4,543,868

CLASS 84

1.01 4,543,869
96 4,543,870
403 4,543,871

CLASS 86

1 B 4,543,872

CLASS 89

1.59 4,543,873

CLASS 91

387 4,543,874
459 4,543,875
506 4,543,876

CLASS 92

90 4,543,877

CLASS 99

330 4,543,878
472 4,543,879

CLASS D34

17 B1 8,265,517

CLASS 100

37 4,543,880
121 4,543,881

CLASS 101

35 4,543,882
38 A 4,543,883
93.04 4,543,884

CLASS 102

373 4,543,885

CLASS 104

53 4,543,886

CLASS 105

355 4,543,887
377 4,543,888
4,543,889

CLASS 106

14.12 4,544,408
18.14 4,544,409
278 4,544,410
279 4,544,411
286.5 4,544,412
287.14 4,544,413
287.24 4,544,414
288 R 4,544,415

CLASS 110

102 4,543,890
185 4,543,891
203 4,543,892
338 4,543,893
347 4,543,894

CLASS 112

104 4,543,895
162 4,543,896
221 4,543,897

CLASS 114

39 4,543,898
4,543,899
40 4,543,900
67 A 4,543,901
74 R 4,543,902
263 4,543,903
294 4,543,904

CLASS 116

63 P 4,543,905

CLASS 118

19 4,543,907
326 4,543,908
4,543,909
665 4,543,910

CLASS 119

1 4,543,911
18 4,543,912
85 4,543,913

CLASS 123

41.31 4,543,914
41.65 4,543,915
48 A 4,543,916
51 B 4,543,917
52 MB 4,543,918
56 BC 4,543,919
73 A 4,543,921
90.43 4,543,920
179 F 4,543,923
179 S 4,543,922
182 4,543,927
188 S 4,543,925
195 A 4,543,924
242 4,543,926
262 4,543,928
263 4,543,929
299 4,543,930
308 4,543,931
342 4,543,932
361 4,543,933
435 4,543,934
463 4,543,935
475 4,543,936
491 4,543,937
514 4,543,938
533 4,543,939

CLASS 126

92 AC 4,543,940
293 4,543,941
314 4,543,942
350 R 4,543,943
419 4,543,944
438 4,543,945
4,543,946

CLASS 128

75 4,543,947
80 A 4,543,948
127 4,543,949
136 4,543,950
204.25 4,543,951
335.5 4,543,952
419 PG 4,543,954
4,543,956
419 PT 4,543,953
630 4,543,957
635 4,543,955
640 4,543,958
653 4,543,959
660 4,543,960
667 4,543,961
682 4,543,962
702 4,543,963
743 4,543,964
748 4,543,965
754 4,543,966

CLASS 131

84.3 4,543,967

CLASS 132

33 R 4,543,968
40 B1 4,327,753

CLASS 133

3 A 4,543,969

CLASS 134

62 4,543,970

CLASS 135

16 4,543,971
118 4,543,972

CLASS 136

249 4,544,797
251 4,544,798
262 4,544,799

CLASS 137

1 4,543,973
66 4,543,974
85 4,543,975
101 4,543,976
115 4,543,977
255 4,543,978
315 4,543,979
4,543,980
4,543,981
355.2 4,543,982
356 4,543,983
385 4,543,984
505.25 4,543,985
515.7 4,543,986
540 4,543,987
542 4,543,988
543.19 4,543,989
556 4,543,990
595 4,543,991
614 4,543,992
614.03 4,543,993
614.04 4,543,994
614.06 4,543,995
625.43 4,543,996

CLASS 138

30 4,543,997
110 4,543,998

CLASS 139

1 C 4,543,999
66 R 4,544,000
443 4,544,001

CLASS 140

89 4,544,002
147 4,544,003

CLASS 141

31 4,544,004
94 4,544,005
105 4,544,006
392 4,544,007

CLASS 144

193 A 4,544,008
230 4,544,009

CLASS 148

1.5 4,544,416
4,544,417
4,544,418
12 C 4,544,419
37 4,544,420
103 4,544,421
142 4,544,422
174 4,544,423

CLASS 152

231 4,544,010

CLASS 155

612 4,545,075

CLASS 156

39 4,544,424

73.1 4,544,425
73.6 4,544,426
97 4,544,427
161 4,544,428
227 4,544,429
235 4,544,430
256 4,544,431
307.3 4,544,432
384 4,544,433
4,544,434
428 4,544,435
549 4,544,436
584 4,544,437
624 4,544,438
626 4,544,439
634 4,544,440
4,544,441
639 4,544,446
643 4,544,442
4,544,443
4,544,444
4,544,445

CLASS 160

84 R 4,544,011
90 4,544,012

CLASS 162

300 4,544,447
360.1 4,544,448
374 4,544,449

CLASS 164

5 4,544,013
429 4,544,014
442 4,544,015
467 4,544,016
472 4,544,017
481 4,544,018
496 4,544,019

CLASS 165

1 4,544,020
45 4,544,021
47 4,544,022
48 R 4,544,023
4,544,024
65 4,544,025
95 4,544,026
4,544,027
104.14 4,544,028
149 4,544,029
159 4,544,030

CLASS 166

177 4,544,031
267 4,544,032
274 4,544,033
297 4,544,034
299 4,544,035
341 4,544,036
369 4,544,037

CLASS 172

78 4,544,038

CLASS 173

12 4,544,039
91 4,544,040

CLASS 174

65 SS 4,544,800
68.5 4,544,801
4,544,802

CLASS 175

57 4,544,041

CLASS 177

25 4,544,042
194 4,544,043

CLASS 178

1.7 4,543,906
18 4,544,803

CLASS 179

18 BC 4,544,804
99 LS 4,544,808
115.5 PV 4,544,805
4,544,806
175.11 4,544,807
175.2 R 4,544,809

CLASS 180

225 Re.31,994
227 4,544,044

CLASS 188

72.6 4,544,045
79.5 K 4,544,046
170 4,544,047
251 A 4,544,048
364 4,544,049

CLASS 190

115 4,544,050
124 4,544,051

CLASS 192

0.076 4,544,057
56 R 4,544,052
58 B 4,544,053
4,544,054
70.12 4,544,055
71 4,544,056

CLASS 194

102 4,544,058

CLASS 198

453 4,544,059
495 4,544,060
813 4,544,061

CLASS 200

5 B 4,544,810
5 R 4,544,811
19 DC 4,544,812
38 R 4,544,813
50 C 4,544,814
4,544,815
52 R 4,544,816
293 4,544,817

CLASS 202

114 4,544,451

CLASS 203

1 4,544,452
44 4,544,453
51 4,544,454

CLASS 204

1 T 4,544,455
59 R 4,544,450
4,544,456
67 4,544,457
98 4,544,458
103 4,544,459
107 4,544,460
128 4,544,461
129 4,544,462
146 4,544,463
147 4,544,464
148 4,544,465
159.11 4,544,466
159.24 4,544,467
192 R 4,544,468
243 R 4,544,469
248 4,544,470
252 4,544,471
290 R 4,544,472
292 4,544,473
295 4,544,474
300 EC 4,544,475

CLASS 206

509 4,544,062
540 4,544,063

CLASS 208

8 LE 4,544,476
11 R 4,544,477
4,544,478
4,544,479
106 4,544,480
127 4,544,481
215

CLASS 209

583 4,544,064

CLASS 210

222 4,544,482
316 4,544,483
500.2 4,544,484
502.1 4,544,485
512.1 4,544,486
522 4,544,487
664 4,544,488
709 4,544,489
713 4,544,490
772 4,544,491

CLASS 211

13 4,544,065
41 4,544,066
70.6 4,544,067
74 4,544,068
183 4,544,069

CLASS 212

147 4,544,070
264 4,544,071

CLASS 213

166 4,544,072

CLASS 215

246 4,544,073
355 4,544,074

CLASS 219

10.49 R 4,544,818
69 M 4,544,820
69 W 4,544,819
91.2 4,544,821

120 4,544,822
121 LG 4,544,824
121 PK 4,544,823
137 PS 4,544,826
137 R 4,544,825
137.63 4,544,827
216 4,544,828
237 4,544,829
328 4,544,830
449 4,544,831

CLASS 220

82 R 4,544,075
210 4,544,076
256 4,544,078
277 4,544,079
359 4,544,080
449 4,544,077

CLASS 221

155 4,544,081
200 4,544,082

CLASS 222

47 4,544,083
56 4,544,084
146.4 4,544,085
649 4,544,086

CLASS 224

148 4,544,087
159 4,544,088
192 4,544,089

CLASS 227

131 4,544,090

CLASS 228

124 4,544,091

CLASS 229

15 4,544,092
43 4,544,093

CLASS 235

377 4,544,832
379 4,544,833
487 4,544,834
4,544,835
4,544,836

CLASS 238

10 R 4,544,094

CLASS 239

8 4,544,095
92 4,544,096
126 4,544,097
127.3 4,544,098
271 4,544,099
407 4,544,100

CLASS 241

24 4,544,101
4,544,102
37.5 4,544,103
57 4,544,104
73 4,544,105
101 A 4,544,106

CLASS 242

35.5 A 4,544,107
43 R 4,544,108
58.1 4,544,109
67.1 R 4,544,110
84.52 B 4,544,111
107.2 4,544,112
178 4,544,113
213 4,544,114

CLASS 244

54 4,544,115
108 4,544,116
210 4,544,117
225 4,544,118

CLASS 248

58 4,544,119
122 4,544,120
331 4,544,121
346 4,544,122
460 4,544,123
552 4,544,124
624 4,544,125

CLASS 249

83 4,544,126

CLASS 250

201 4,544,837
202 4,544,838
205 4,544,839
221 4,544,841
227 4,544,840
4,544,842
239 4,544,843
330 4,544,844
396 ML 4,544,846
4,544,847

396 R 4,544,845
578 4,544,848

CLASS 251

9 4,544,127
30.01 4,544,128
129.01 4,544,129
208 4,544,130
309 4,544,131
318 4,544,132
344 4,544,133

CLASS 252

32.7 E 4,544,492
89.1 4,544,493
135 4,544,494
174.21 4,544,495
299.5 4,544,497
301.35 4,544,496
522 R 4,544,714
547 4,544,498
629 4,544,499

CLASS 254

93 R 4,544,134
108 4,544,135
323 4,544,136
337 4,544,137

CLASS 260

112.5 R 4,544,500
239 EP 4,544,501
349 4,544,502
397.4 4,544,555
402 4,544,503
408 4,544,504
413 4,544,505
462 R 4,544,506
463 4,544,507
465 D 4,544,508
4,544,510
465 G 4,544,509
549 4,544,511
925 4,544,512

CLASS 261

153 4,544,513
4,544,514

CLASS 264

32 4,544,515
108 4,544,516
113 4,544,517
257 4,544,518
328.1 4,544,519

CLASS 266

44 4,544,138
48 4,544,139
99 4,544,140
215 4,544,141
252 4,544,142
273 4,544,143

CLASS 267

64.15 4,544,144

CLASS 269

69 4,544,145

CLASS 270

58 4,544,146

CLASS 271

3.1 4,544,148
35 4,544,147
107 4,544,149
145 4,544,150
251 4,544,151

CLASS 272

69 4,544,152
97 4,544,153
129 4,544,154
136 4,544,155

CLASS 273

5 A 4,544,156
67 A 4,544,157
150 4,544,158
183 A 4,544,159
186 C 4,544,160
187 A 4,544,161
242 4,544,162
416 4,544,163

CLASS 277

25 4,544,164
34 4,544,165
57 4,544,166
82 4,544,167
84 4,544,168
235 B 4,544,169

CLASS 280

21 R 4,544,170
33.99 A 4,544,171
47.13 B 4,544,172

47.33 4,544,173
255 4,544,174
402 4,544,175
481 4,544,176
604 4,544,179
605 4,544,177
642 4,544,178
689 4,544,180

CLASS 283

74 4,544,181
81 4,544,182
85 4,544,183
94 4,544,184

CLASS 285

137 R 4,544,185
243 4,544,186
256 4,544,187
337 4,544,188

CLASS 290

53 4,544,849

CLASS 292

50 4,544,189
307 B 4,544,190
341.15 4,544,191
341.18 4,544,192

CLASS 294

86.4 4,544,193
87.2 4,544,194

CLASS 296

26 4,544,195
4,544,196
84 R 4,544,197
155 4,544,198

CLASS 297

244 4,544,199
265 4,544,200
271 4,544,201
349 4,544,202
391 4,544,203
452 4,544,204
455 4,544,205

CLASS 299

4 4,544,206
5 4,544,207
12 4,544,208

CLASS 301

37 AT 4,544,209

CLASS 303

6 C 4,544,210

CLASS 307

269 4,544,850
480 4,544,851
519 4,544,852
530 4,544,853
576 4,544,854

CLASS 308

6 C 4,544,211
6 R 4,544,212

CLASS 310

59 4,544,855
71 4,544,856
313 B 4,544,857
321 4,544,858
335 4,544,859

CLASS 312

183 4,544,213
209 4,544,214

CLASS 313

103 CM 4,544,860

CLASS 315

3.5 Re.31,996
200 R 4,544,861
209 R 4,544,862
4,544,863
393 4,544,864

CLASS 318

53 4,544,865
54 4,544,866
129 4,544,867
254 4,544,868
293 4,544,869
444 4,544,870
568 4,544,871
632 4,544,872
801 4,544,873

CLASS 322

10 4,544,874

CLASS 323

280 4,544,875
282 4,544,876

308 4,544,877
315 4,544,878

CLASS 324

57 R 4,544,879
58.5 R 4,544,880
73 PC 4,544,881
73 R 4,544,882
77 CS 4,544,883
78 R 4,544,884
121 R 4,544,885
158 F 4,544,886
158 P 4,544,888
4,544,889
158 R 4,544,887
163 4,544,890
304 4,544,891
334 4,544,892
433 4,544,893

CLASS 329

122 4,544,894

CLASS 330

273 4,544,895
284 4,544,896

CLASS 331

116 R 4,544,897

CLASS 332

7.51 4,544,898

CLASS 333

17 R 4,544,899
21 A 4,544,900
212 4,544,901
250 4,544,902

CLASS 335

205 4,544,903
302 4,544,904

CLASS 336

136 4,544,905
206 4,544,906

CLASS 337

262 4,544,907
279 4,544,908

CLASS 339

5 M 4,544,215
14 P 4,544,216
17 M 4,544,217
31 L 4,544,218
40 4,544,219
59 M 4,544,220
60 M 4,544,221
75 M 4,544,222
75 MP 4,544,223
89 M 4,544,224
91 R 4,544,225
113 R Re.31,995
130 R 4,544,226
143 R 4,544,227

CLASS 340

52 R 4,544,909
333 4,544,910
347 4,544,919
347 AD 4,544,912
4,544,914
4,544,917
4,544,918
347 DA 4,544,911
347 DD 4,544,916
347 P 4,544,913
4,544,915
565 4,544,920
584 4,544,921
728 4,544,922
825.69 4,544,923
4,544,924

CLASS 343

18 E 4,544,925
4,544,926
373 4,544,927
781 P 4,544,928

CLASS 346

9 4,544,929
75 4,544,930
140 R 4,544,931
4,544,932
4,544,933
154 4,544,934
155 4,544,935
209 4,544,936

CLASS 350

6.4 4,544,228
96.14 4,544,229
4,544,230
96.15 4,544,231
4,544,232
96.20 4,544,233

96.21 4,544,234
96.34 4,544,235
247 4,544,236
331 R 4,544,237
336 4,544,238
376 4,544,239
429 4,544,240
486 4,544,241
4,544,242
514 4,544,243
520 4,544,244

CLASS 351

120 4,544,245
211 4,544,246

CLASS 352

62 4,544,247

CLASS 354

4,544,248
195.12 4,544,249
199 4,544,250
288 4,544,251
289.1 4,544,252
321 4,544,253
403 4,544,254
406 4,544,255
429 4,544,256
460 4,544,257

CLASS 355

1 4,544,258
4,544,259
3 BE 4,544,260
3 CH 4,544,261
3 TR 4,544,262
14 E 4,544,263
14 R 4,544,264
76 4,544,265

CLASS 356

71 4,544,266
4,544,267
222 4,544,269
313 4,544,270
328 4,544,271
346 4,544,272
394 4,544,268
434 4,544,273
436 4,544,274

CLASS 357

5 4,544,937
30 4,544,938
4,544,939
35 4,544,940
71 4,544,941
81 4,544,942

CLASS 358

25 4,544,943
28 4,544,944
30 4,544,945
60 4,544,946
65 4,544,947
111 4,544,948
4,544,949
143 4,544,950
172 4,544,951
210 4,544,952
227 4,544,953
243 4,544,954
246 4,544,955
296 4,544,956
338 4,544,957

CLASS 360

8 4,544,958
33.1 4,544,959
35.1 4,544,960
40 4,544,961
4,544,962
4,544,963
51 4,544,964
71 4,544,965
75 4,544,966
77 4,544,967
78 4,544,968
4,544,969
94 4,544,970
96.5 4,544,971
105 4,544,972
106 4,544,973
120 4,544,974
130.33 4,544,975
132 4,544,976
133 4,544,977

CLASS 361

4 4,544,978
19 4,544,979
45 4,544,980
93 4,544,981
96 4,544,982
119 4,544,983
4,544,984
144 4,544,985

152 4,544,986
194 4,544,987
211 4,544,988
401 4,544,989

CLASS 362

32 4,544,990
81 4,544,991
147 4,544,992
153 4,544,993
192 4,544,994
225 4,544,995
238 4,544,996
263 4,544,997
267 4,544,998
298 4,544,999
304 4,545,000
329 4,545,007
340 4,545,001

CLASS 363

37 4,545,002
63 4,545,004
68 4,545,005
124 4,545,006

CLASS 364

148 4,545,008
164 4,545,009
200 4,545,010
4,545,011
4,545,012
4,545,013
4,545,014
4,545,015
4,545,016
422 4,545,017
431.12 Re.31,997
463 4,545,019
474 4,545,018
509 4,545,020
571 4,545,021
709 4,545,022
4,545,023
717 4,545,024
724 4,545,026
4,545,027
728 4,545,025
760 4,545,028
900 4,545,029
4,545,030
4,545,031
4,545,032

CLASS 365

51 4,545,033
182 4,545,034
185 4,545,035
189 4,545,036
205 4,545,037
230 4,545,038

CLASS 366

30 4,544,275
78 4,544,277
129 4,544,278
132 4,544,279
141 4,544,280
325 4,544,281

CLASS 367

39 4,545,039
76 4,545,040
157 4,545,041
189 4,545,042

CLASS 368

179 4,544,282
251 4,544,283
294 4,544,284

CLASS 369

32 4,545,043
4,545,044
43 4,545,003
77.2 4,545,045
111 4,545,046
290 4,545,047

CLASS 370

1 4,545,048
16 4,545,049
62 4,545,050
66 4,545,051
68 4,545,052
4,545,053

CLASS 371

43 4,545,054
55 4,545,055

CLASS 372

2 4,545,056
45 4,545,057

CLASS 373

73 4,545,058

CLASS 375

1 4,545,059
14 4,545,060
119 4,545,061

CLASS 376

152 4,544,520
209 4,544,521
441 4,544,522

CLASS 377

6 4,545,062
52 4,545,063

CLASS 378

132 4,545,064

CLASS 381

41 4,545,065

CLASS 382

11 4,545,066
21 4,545,067
41 4,545,068
46 4,545,069
48 4,545,070

CLASS 384

99 4,544,285
486 4,544,286

CLASS 400

110 4,544,276
120 4,544,287
121 4,544,288
154.5 4,544,289
175 4,544,290
208 4,544,291
241.2 4,544,292
320 4,544,293
636.2 4,544,294

CLASS 401

65 4,544,295
73 4,544,296
217 4,544,297

CLASS 402

19 4,544,298

CLASS 403

150 4,544,299
170 4,544,300
300 4,544,301

CLASS 404

2 4,544,302
6 4,544,303
17 4,544,304
41 4,544,305

CLASS 406

30 4,544,306

CLASS 408

72 B 4,544,307
82 4,544,308
157 4,544,309

CLASS 409

82 4,544,310
224 4,544,311

CLASS 411

3 4,544,312
411 4,544,313

CLASS 413

26 4,544,314

CLASS 414

115 4,544,315
144 4,544,316
217 4,544,317
222 4,544,318
505 4,544,319
511 4,544,320
542 4,544,321
589 4,544,322
785 4,544,323
4,544,324

CLASS 415

150 4,544,325
151 4,544,326

CLASS 416

241 B 4,544,327

CLASS 417

33 4,544,328
53 4,544,329
218 4,544,330
269 4,544,331
4,544,332
299 4,544,333
360 4,544,334
401 4,544,335
412 4,544,336

CLASS 418

15 4,544,337
63 4,544,338

CLASS 419

8 4,544,523
9 4,544,524

CLASS 422

171 4,544,525
173 4,544,526
188 4,544,527
246 4,544,528
303 4,544,529

CLASS 423

10 4,544,530
19 4,544,531
24 4,544,532
67 4,544,533
230 4,544,534
290 4,544,535
300 4,544,536
4,544,537
326 4,544,538
328 4,544,539
446 4,544,540
508 4,544,541
555 4,544,542
588 4,544,543
659 4,544,544

CLASS 424

1.1 4,544,545
7.1 4,544,546
14 4,544,547
93 4,544,548
114 4,544,549
127 4,544,550
147 4,544,551
238 4,544,554

CLASS 425

174.8 R 4,544,339
183 4,544,340
192 R 4,544,341
193 4,544,342
224 4,544,343
324.1 4,544,344
405 R 4,544,345
456 4,544,346

CLASS 426

48 4,544,558
72 4,544,559
104 4,544,560
4,544,561
276 4,544,563
462 4,544,564
538 4,544,565
548 4,544,566
594 4,544,567
650 4,544,568
653 4,544,569

CLASS 427

27 4,544,570
40 4,544,571
44 4,544,572
4,544,573
48 4,544,574
74 4,544,575
82 4,544,576
97 4,544,577
140 4,544,578
175 4,544,579
261 4,544,580
383.7 4,544,581
407.1 4,544,582

CLASS 428

1 4,544,583
15 4,544,584
17 4,544,585
29 4,544,586
34 4,544,587
35 4,544,588
4,544,589
40 4,544,590
65 4,544,591
68 4,544,592
80 4,544,593
92 4,544,594
116 4,544,595
171 4,544,596
182 4,544,597
246 4,544,598
262 4,544,599
323 4,544,600
330 4,544,601
336 4,544,602
371 4,544,603
402 4,544,604
404 4,544,605
454 4,544,606
472 4,544,607
498 4,544,608
507 4,544,609
611 4,544,610
673 4,544,611
692 4,544,612

CLASS 429

91 4,544,613
193 4,544,614
194 4,544,615
229 4,544,616

CLASS 430

58 4,544,617
102 4,544,618
258 4,544,619
264 4,544,620
271 4,544,621
278 4,544,622
280 4,544,623
281 4,544,624
284 4,544,625
311 4,544,626
325 4,544,627
572 4,544,628

CLASS 431

125 4,544,347
146 4,544,348
258 4,544,349
285 4,544,350
288 4,544,351

CLASS 432

133 4,544,352

CLASS 433

9 4,544,353
42 4,544,354
104 4,544,355
122 4,544,356
136 4,544,357
172 4,544,358
199 4,544,359

CLASS 434

178 4,544,360
296 4,544,361

CLASS 435

7 4,544,629
11 4,544,630
14 4,544,631
68 4,544,632
86 4,544,633
119 4,544,634
121 4,544,635
253 4,544,636
4,544,637
273 4,544,638

CLASS 436

104 4,544,639
506 4,544,640

CLASS 440

61 4,544,362
73 4,544,363

CLASS 441

6 4,544,364

CLASS 446

73 4,544,365

CLASS 455

33 4,545,071
183 4,545,072
325 4,545,073
600 4,545,078
601 4,545,074
612 4,545,076
4,545,077

CLASS 493

1 4,544,367
27 4,544,368

CLASS 501

87 4,544,641
88 4,544,642
127 4,544,643
134 4,544,644

CLASS 502

66 4,544,645
109 4,544,646
115 4,544,647
119 4,544,648
350 4,544,649
424 4,544,650

CLASS 514

23 4,544,552
92 4,544,553
120 4,544,651
127 4,544,652
202 4,544,653
210 4,544,557
4,544,654
222 4,544,655
228 4,544,656
247 4,544,562
253 4,544,657
254 4,544,658
263 4,544,556
297 4,544,659
329 4,544,660
345 4,544,661
374 4,544,662
378 4,544,663
396 4,544,664
412 4,544,665
460 4,544,666
470 4,544,667
563 4,544,668
4,544,669
617 4,544,670

CLASS 518

700 4,544,671
4,544,672
713 4,544,673
717 4,544,674

CLASS 521

43 4,544,675
84.1 4,544,676
91 4,544,677
107 4,544,678
116 4,544,679
128 4,544,680
134 4,544,681
142 4,544,682

CLASS 523

111 4,544,683
136 4,544,684
200 4,544,685
411 4,544,686
414 4,544,687
458 4,544,688

CLASS 524

52 4,544,689
60 4,544,690
99 4,544,691
347 4,544,723
361 4,544,692
375 4,544,693
385 4,544,694
405 4,544,695
428 4,544,696
458 4,544,697
503 4,544,698
512 4,544,699
543 4,544,700
609 4,544,701

CLASS 525

66 4,544,702
92 4,544,703
108 4,544,704
132 4,544,705
146 4,544,706
330.4 4,544,707
332.2 4,544,710
337 4,544,708
344 4,544,709
348 4,544,711
356 4,544,712
432 4,544,713
528 4,544,715

CLASS 526

119 4,544,716
125 4,544,717
141 4,544,718
240 4,544,719
247 4,544,720
249 4,544,721
264 4,544,722
279 4,544,724
301 4,544,725
309 4,544,726
313 4,544,727

CLASS 528

21 4,544,728
28 4,544,729
78 4,544,730
89 4,544,731
90 4,544,732
123 4,544,733
288 4,544,734
374 4,544,735

CLASS 534

575 4,544,736
605 4,544,737
617 4,544,738
619 4,544,739

CLASS 536

23 4,544,740

CLASSIFICATION OF PATENTS

27	4,544,741
CLASS 544	
8	4,544,742
64	4,544,743
182	4,544,744
CLASS 546	
89	4,544,745
103	4,544,746
156	4,544,747
167	4,544,748
184	4,544,749
290	4,544,750
CLASS 548	
127	4,544,751
214	4,544,752
245	4,544,753
301	4,544,754
335	4,544,755
354	4,544,756
432	4,544,757
CLASS 549	
407	4,544,758
CLASS 556	
36	4,544,759
40	4,544,760
130	4,544,761
179	4,544,762
CLASS 560	
26	4,544,763
29	4,544,765
56	4,544,764
75	4,544,766
263	4,544,767
CLASS 564	
206	4,544,768
242	4,544,769
CLASS 568	
9	4,544,770
329	4,544,771
411	4,544,772
487	4,544,773
617	4,544,774
675	4,544,775
697	4,544,776
	4,544,777
872	4,544,778
918	4,544,779
CLASS 585	
377	4,544,780
408	4,544,781
443	4,544,782
469	4,544,783
500	4,544,784
	4,544,785
	4,544,786
	4,544,787
501	4,544,788
511	4,544,789
516	4,544,790
517	4,544,791
533	4,544,792
640	4,544,793
721	4,544,794
	4,544,795
856	4,544,796
CLASS 604	
155	4,544,369
319	4,544,370
891	4,544,371
CLASS 623	
6	4,543,673

CLASSIFICATION OF DESIGNS

D2—	29	280,775
	309	280,776
	310	280,777
		280,778
	361	280,779
D3—	48	280,780
	66	280,781
	71	280,782
		280,783
D4—	122	280,784
D6—	324	280,785
	366	280,786
	381	280,787
	406	280,788
	455	280,789
	471	280,790
	559	280,791
	575	280,792
D7—	43	280,793
D8—	1	280,794
	14	280,795
	61	280,796
	68	280,797
	102	280,798
	302	280,799
	380	280,800
D9—	367	280,801
	446	280,802
D10—	39	280,803
	75	280,804
	92	280,805
D12—	158	280,806
	197	280,807
	314	280,808
	316	280,809
D13—	4	280,810
	23	280,811
	24	280,812
	28	280,813
	38	280,814
D14—	11	280,815
	30	280,817
	34	280,818
	63	280,816
	100	280,819
	106	280,820
		280,821
	114	280,822
D15—	7	280,823
	12	280,824
	69	280,825
		280,826
	199	280,827
D16—	26	280,828
	47	280,829
	113	280,830
	116	280,831
D18—	7	280,832
	24	280,833
D21—	13	280,834
		280,835
		280,836
	64	280,837
	90	280,838
	190	280,839
	191	280,840
		280,841
		280,842
	238	280,843
		280,844
		280,845
D22—	25	280,846
D23—	22	280,847
D24—	25	280,848
D26—	28	280,849
	102	280,850
D28—	12	280,851
	83	280,852
		280,853
	91.1	280,854
D32—	53.1	280,855
D34—	B1, Des.	265,517
	5	280,856
	11	280,857
	18	280,858
	25	280,859

CLASSIFICATION OF PLANTS

P.—	7	5,564
	73	5,565
	74	5,566
	79	5,567
		5,568

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,543,882	4,544,089	4,544,843	4,544,412	4,543,763	18 : 4,543,675
4,544,025	4,544,094	4,544,867	4,544,425	4,543,777	4,543,714
4,544,188	4,544,112	4,544,869	4,544,463	4,543,795	4,543,954
04 : 4,544,012	4,544,117	4,544,875	4,544,483	4,543,840	4,544,045
4,544,321	4,544,134	4,544,882	4,544,542	4,543,861	4,544,485
4,544,351	4,544,155	4,544,886	4,544,680	4,543,888	4,544,527
4,544,460	4,544,183	4,544,888	4,544,702	4,543,889	4,544,587
4,544,513	4,544,213	4,544,889	4,544,730	4,543,891	4,544,734
4,544,532	4,544,216	4,544,900	4,544,779	4,543,908	4,544,752
4,544,876	4,544,217	4,544,904	4,544,873	4,543,916	4,544,812
4,544,913	4,544,224	4,544,914	4,545,064	4,543,949	4,544,923
4,544,920	4,544,228	4,544,943	4,545,075	4,543,969	4,544,924
4,545,007	4,544,237	4,544,954	10 : 4,544,386	4,543,978	4,544,940
05 : 4,544,346	4,544,241	4,544,961	4,544,401	4,544,046	4,544,946
06 : Re.31,995	4,544,243	4,544,963	4,544,484	4,544,065	4,544,991
4,543,669	4,544,245	4,544,967	4,544,611	4,544,066	19 : 4,543,786
4,543,673	4,544,246	4,544,974	4,544,690	4,544,083	4,543,820
4,543,674	4,544,272	4,544,996	4,544,721	4,544,085	4,544,067
4,543,677	4,544,289	4,545,012	4,544,724	4,544,092	4,544,071
4,543,680	4,544,311	4,545,015	4,544,746	4,544,128	4,544,176
4,543,683	4,544,312	4,545,022	4,544,799	4,544,132	4,545,059
4,543,737	4,544,353	4,545,028	12 : 4,543,742	4,544,146	20 : 4,543,678
4,543,757	4,544,362	4,545,032	4,543,772	4,544,156	4,543,729
4,543,775	4,544,371	4,545,052	4,543,913	4,544,161	4,544,076
4,543,819	4,544,379	4,545,055	4,543,953	4,544,162	4,544,218
4,543,826	4,544,398	4,545,077	4,543,955	4,544,169	4,544,827
4,543,832	4,544,399	08 : 4,543,836	4,543,956	4,544,200	21 : 4,543,699
4,543,857	4,544,400	4,544,037	4,543,961	4,544,205	4,543,743
4,543,858	4,544,413	4,544,114	4,543,962	4,544,375	4,543,799
4,543,860	4,544,418	4,544,264	4,543,985	4,544,403	4,544,195
4,543,872	4,544,421	4,544,300	4,544,058	4,544,472	4,544,411
4,543,894	4,544,465	4,544,361	4,544,078	4,544,477	22 : 4,543,901
4,543,900	4,544,478	4,544,370	4,544,081	4,544,506	4,543,917
4,543,905	4,544,491	4,544,541	4,544,086	4,544,546	4,544,350
4,543,928	4,544,500	4,544,597	4,544,098	4,544,564	4,544,481
4,543,940	4,544,522	4,544,859	4,544,160	4,544,614	4,544,503
4,543,944	4,544,533	4,544,892	4,544,186	4,544,616	4,544,505
4,543,945	4,544,538	4,545,045	4,544,357	4,544,646	4,544,509
4,543,947	4,544,560	4,545,047	4,544,363	4,544,692	4,544,647
4,543,974	4,544,584	4,545,053	4,544,613	4,544,786	23 : 4,545,062
4,543,984	4,544,595	09 : 4,543,716	4,544,861	4,544,787	24 : 4,543,667
4,543,992	4,544,636	4,543,721	4,545,027	4,544,789	4,543,738
4,543,993	4,544,638	4,543,764	4,545,041	4,544,796	4,543,837
4,544,003	4,544,645	4,543,804	4,545,054	4,544,804	4,543,971
4,544,005	4,544,651	4,543,807	4,545,074	4,544,811	4,544,055
4,544,028	4,544,661	4,543,833	13 : 4,544,234	4,544,850	4,544,469
4,544,031	4,544,699	4,544,103	4,544,296	4,544,865	4,544,499
4,544,063	4,544,707	4,544,150	4,544,328	4,544,866	4,544,637
4,544,068	4,544,765	4,544,219	4,544,352	4,544,919	4,544,840
4,544,074	4,544,782	4,544,226	4,544,364	4,545,043	4,544,870
4,544,077	4,544,802	4,544,302	16 : 4,543,990	4,545,058	4,544,917
4,544,080	4,544,832	4,544,329	17 : 4,543,722	4,545,071	4,545,030
4,544,084	4,544,835	4,544,359	4,543,734	4,545,072	4,545,056

25 : 4,543,706
4,543,792
4,543,793
4,543,895
4,544,091
4,544,154
4,544,158
4,544,214
4,544,230
4,544,369
4,544,480
4,544,545
4,544,586
4,544,619
4,544,677
4,544,836
4,544,846
4,544,847
4,544,887
4,544,916
4,544,927
4,544,937
4,545,000
4,545,001
4,545,010
4,545,011
4,545,013
4,545,024
26 : 4,543,732
4,543,747
4,543,789
4,543,800
4,543,814
4,543,823
4,543,843
4,543,848
4,543,859
4,543,863
4,543,887
4,543,890
4,543,920
4,543,935
4,543,936
4,543,938
4,543,964
4,543,972
4,544,002
4,544,013
4,544,014
4,544,054
4,544,056
4,544,116
4,544,122
4,544,125
4,544,126
4,544,133
4,544,163
4,544,171
4,544,175
4,544,189
4,544,192
4,544,199
4,544,215
4,544,323
4,544,325
4,544,388
4,544,432
4,544,444
4,544,461
4,544,470
4,544,473
4,544,495
4,544,517
4,544,526
4,544,581
4,544,582
4,544,681
4,544,696
4,544,697
4,544,706
4,544,763
4,544,764
4,544,768
4,544,798
4,544,809
4,544,856
4,544,868
4,544,880
4,544,988
4,544,993
4,545,004
8,265,517
27 : 4,543,668
4,543,681
4,543,718
4,543,740
4,543,750
4,543,771
4,543,927
4,543,994
4,544,023
4,544,170
4,544,273
4,544,308
4,544,467
4,544,577
4,544,622
4,544,629
4,544,820
4,544,968
29 : 4,543,688
4,543,760
4,543,835
4,543,851
4,544,072
4,544,073
4,544,096
4,544,306
4,544,569
4,544,693
4,544,712
30 : 4,543,948
4,544,307
4,544,454
31 : 4,543,919
33 : 4,544,368
4,544,942
34 : 4,543,670
4,543,679
4,543,713
4,543,715
4,543,733
4,543,748
4,543,803
4,543,883
4,543,952
4,543,963
4,544,052
4,544,152
4,544,190
4,544,239
4,544,301
4,544,356
4,544,390
4,544,422
4,544,438
4,544,476
4,544,494
4,544,502
4,544,507
4,544,535
4,544,543
4,544,554
4,544,557
4,544,567
4,544,592
4,544,594
4,544,596
4,544,649
4,544,654
4,544,663
4,544,671
4,544,672
4,544,674
4,544,678
4,544,685
4,544,688
4,544,694
4,544,705
4,544,745
4,544,753
4,544,754
4,544,757
4,544,758
4,544,760
4,544,775
4,544,783
4,544,788
4,544,803
4,544,807
4,544,822
4,544,878
4,544,911
4,544,915
4,544,929
4,544,939
4,544,944
4,544,945
4,544,950
4,544,990
4,545,073
35 : 4,544,274
4,544,376
4,544,520
36 : 4,543,672
4,543,705
4,543,735
4,543,761
4,543,871
4,543,911
4,544,051
4,544,120
4,544,207
4,544,223
4,544,225
4,544,260
4,544,265
4,544,267
4,544,276
4,544,285
4,544,317
4,544,365
4,544,439
4,544,442
4,544,456
4,544,493
4,544,501
4,544,504
4,544,565
4,544,566
4,544,576
4,544,617
4,544,618
4,544,665
4,544,691
4,544,703
4,544,723
4,544,759
4,544,778
4,544,801
4,544,898
4,544,938
4,544,953
4,544,955
4,544,969
4,544,981
4,544,994
4,545,033
4,545,061
4,545,069
37 : 4,543,822
4,543,932
4,543,987
4,544,123
4,544,201
4,544,211
4,544,220
4,544,634
4,544,817
38 : 4,544,038
4,544,196
39 : 4,543,710
4,543,766
4,543,797
4,543,812
4,543,839
4,543,864
4,543,873
4,543,909
4,543,950
4,543,957
4,543,958
4,543,983
4,543,989
4,544,024
4,544,049
4,544,090
4,544,100
4,544,136
4,544,139
4,544,149
4,544,173
4,544,184
4,544,194
4,544,202
4,544,229
4,544,304
4,544,305
4,544,309
4,544,392
4,544,393
4,544,427
4,544,434
4,544,457
4,544,487
4,544,516
4,544,537
4,544,590
4,544,603
4,544,668
4,544,669
4,544,673
4,544,675
4,544,682
4,544,695
4,544,710
4,544,713
4,544,877
4,544,930
4,544,998
40 : 4,543,973
4,544,007
4,544,041
4,544,088
4,544,119
4,544,206
4,544,366
4,544,466
4,544,700
4,544,701
4,544,716
4,544,718
4,544,735
4,544,767
4,544,790
4,544,890
41 : 4,544,440
42 : 4,544,902
4,543,704
4,543,728
4,543,754
4,543,755
4,543,881
4,543,912
4,544,043
4,544,044
4,544,047
4,544,101
4,544,102
4,544,182
4,544,208
4,544,303
4,544,378
4,544,394
4,544,396
4,544,404
4,544,408
4,544,417
4,544,420
4,544,446
4,544,453
4,544,458
4,544,475
4,544,479
4,544,488
4,544,523
4,544,553
4,544,571
4,544,600
4,544,626
4,544,639
4,544,643
4,544,667
4,544,670
4,544,679
4,544,711
4,544,781
4,544,784
4,544,785
4,544,792
4,544,891
4,544,908
4,544,928
4,544,932
4,544,978
4,544,992
4,545,018
4,545,029
44 : 4,543,695
4,544,528
4,544,987
45 : 4,544,609
4,544,726
47 : 4,543,697
4,543,730
4,543,778
4,543,798
4,543,892
4,543,982
4,544,159
4,544,474
4,544,825
4,544,839
4,544,979
48 : Re.31,993
4,543,689
4,543,700
4,543,703
4,543,741
4,543,745
4,543,781
4,543,821
4,543,898
4,543,907
4,543,930
4,543,946
4,543,979
4,543,986
4,543,998
4,544,032
4,544,034
4,544,036
49 : 4,543,744
4,544,741
51 : 4,543,765
4,543,767
4,544,124
4,544,231
4,544,314
4,544,322
4,544,578
4,544,579
4,544,844
4,545,002
4,545,025
53 : 4,543,717
4,543,903
4,543,960
4,544,040
4,544,118
4,544,145
4,544,203
4,544,319
4,544,354
4,545,019
4,545,020
55 : 4,543,758
4,543,773
4,543,796
4,543,806
4,543,850
4,543,942
4,543,996
4,544,008
4,544,026
4,544,030
4,544,048
4,544,061
4,544,070
4,544,153
4,544,490
4,544,572
4,544,620
4,544,810
4,544,814
4,544,035
56 : 4,544,293
4,544,135
4,544,137
4,544,165
4,544,167
4,544,193
4,544,334
4,544,335
4,544,387
4,544,389
4,544,416
4,544,452
4,544,539
4,544,704
4,544,719
4,544,722
4,544,731
4,544,732
4,544,756
4,544,777
4,544,780
4,544,794
4,544,795
4,544,851
4,544,854
4,544,874
4,545,016
4,545,017
4,545,026
4,545,034
4,545,035
4,545,036
4,545,038
4,545,039
4,545,040
4,545,076

DESIGN PATENTS

01 : 280,843
04 : 280,847
06 : 280,775
280,781
280,800
280,818
280,820
280,828
280,839
280,840
280,841
280,842
280,848
280,849
280,850
09 : 280,786
280,799
280,805
280,851
12 : 280,785
17 : 280,803
280,825
280,829
280,835
280,836
20 : 280,859
23 : 280,815
25 : 280,783
280,833
26 : 280,808
27 : 280,844
280,845
280,858
29 : 280,776
280,777
280,778
280,779
33 : 280,822
34 : 280,780
36 : 280,782
280,801
280,813
280,816
280,830
280,831
280,854
280,856
37 : 280,796
39 : 280,827
40 : 280,795
45 : 280,789
47 : 280,787
48 : 280,788
280,811
51 : 280,792
280,857

PLANT PATENTS

06 : 5,564
5,566
5,567
5,568

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner - Designate*